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Assigned: Louis Ridenour

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CONFERENCE

ON

METHODS FOR STUDYING THE PSYCHOLOGICAL EFFECTS

OF

UNCONVENTIONAL WEAPONS

Sponsored by
Social Science Division
The RAND Corporation
Santa Monica

January 21, 1963

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Under the auspices of the Social Science Division of The RAND Corporation, a three-day conference on "Methods of Studying the Psychological Effects of Unconventional Weapons" was held at Santa Monica on January 26-28, 1949.

The conference was devoted to a discussion of:

- 1) Atomic weapons
- 2) Certain radiological weapons
- 3) Unconventional economic weapons
- 4) Psychological warfare
- 5) A possible satellite vehicle

The conference was conducted within the requirements of security classification.

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Collbohm: (Welcoming the guests).

We were unable to get everyone cleared before this meeting. This conference will therefore be unclassified. I would nevertheless think it a good idea for us to hold it as a "restricted" meeting. I suggest that what we say here will not be for publication.

RAND has favored in the past the mixed-team-approach, i.e., close cooperation of specialists in various fields of learning. In this room there are assembled physical scientists, political scientists, economists, psychologists, mathematicians, statisticians, sociologists; many different skills are represented. The problems before us certainly require work by so mixed a team as you represent.

Speier: (asking everybody to introduce himself by name, field of specialization and affiliation).

Goldsen: (Administrative announcements).

Speier: Our discussions are being recorded, but there will be no verbatim distribution of the transcriptions. The transcriptions will serve exclusively as a help to check the running account and the summary we shall later prepare, for accuracy.

We hope that this conference will be the first in a series of meetings. It will also be possible to follow up this conference by special studies in the preparation of which we would like to feel free to request your continued help. Will you regard this meeting as a conference called for the purpose of planning research. We should also appreciate it if you mentioned other experts, in addition to yourselves, whose assistance would be valuable.

All of you have received two memoranda prepared by Mr. Janis in connection with the Crisis and Disaster Studies that are in progress at Yale University as a RAND project. The first memorandum, as you will recall, deals with the psychological impact of air attacks, the second with the psychological aspects of vulnerability to atomic bomb attacks. These reports were sent to you, because we felt they would be of great value to you as background material and reading for this conference. A third memorandum dealing with proposals for field research on the psychological impact of peacetime disasters will become available in the course of this conference. (Copies of this memorandum were distributed to the consultants on January 28.)

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INTRODUCTION BY THE CHAIRMAN

Speaker:

We have called this conference to discuss "Methods of Studying the Psychological Effects of Unconventional Weapons." I shall open our discussions by suggesting specific meanings that we might attribute to the terms "unconventional" and "weapons". Mr. Goldhamer will then briefly outline certain distinctions which he regards as important in examining psychological effects of weapons.

By "unconventional weapon" we do not mean a weapon that is unconventional in that its use would violate international law or convention. Rather, we mean an uncustomary weapon, i.e. a weapon that has not been used on a large scale. Today's conventional weapons are therefore yesterday's unconventional weapons. The history of the technology of weapons is in large measure the history of the transformation of weapons from the unconventional to the conventional type.

In this process every weapon once was at a certain stage a secret weapon. The possession of a secret weapon can be accompanied by attempts to frighten the enemy or the potential enemy with the unknown properties of that weapon. Rumors about secret weapons can also be used to bolster the morale of the home population. Hence, one might consider the possibility of studying the psychological effects of test secret weapons, on friend and foe, in order to learn something, though surely not everything, about present secret, unconventional weapons. Led by such considerations the Washington office of RAND prepared a working paper, copies of which were mailed to you, on the psychological uses the Germans made during World War II of their V-weapons, i.e. on secret weapons propaganda.

We propose not to be rigid about the definition of unconventional weapons as uncustomary weapons. In particular, we would like to include considerations of the A-bomb in our discussions.

As to the term "weapon", strictly speaking its meaning is "an instrument of offensive or defensive combat". Let us not restrict this conference in accordance with this narrow definition. We speak today of economic weapons and propaganda weapons. Certain diplomatic measures can be regarded also as weapons. Weapons, then, are not necessarily only instruments of violence; and let us include in our discussions the psychological effects of non-violent weapons.

Similarly, let us feel free to discuss both violent and non-violent "weapons" in times of peace as well as war. Strictly speaking, weapons are not used in peace time; instead we had better speak of "instruments of policy", military, diplomatic, economic, propagandistic, etc., when referring to peace time conditions. Our discussions of unconventional weapons may

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cover peacetime situations (cold war) despite the terminological liberty we thereby take.

Next, let me comment briefly and schematically on the principal objectives which the instruments of policy or weapons are expected to accomplish, regardless of whether they are conventional or not.

In war, the three possible ultimate objectives may be called

- 1-a Annihilation of the enemy.
- b Unconditional surrender of the enemy.
- c Acceptance of our peace terms by the enemy.

In any of these three cases the enemy ceases fighting. Short of these ultimate objectives, there are, schematically speaking, the following principal objectives:

2. Surrender of enemy individuals or contingents.
3. Incapacitation of the enemy.
4. Subversion on the enemy side.
5. Cooperation of enemies or enemy groups with our authorities.
6. Induced involuntary disclosure by enemies of secrets.

Incapacitation includes, on the psychological side, panic, incitement by means of terror, threats, rumor spreading, etc., withdrawal from political participation ("privatization"), etc.; and, on the non-psychological side, destruction and damaging of enemy facilities, instruments and personnel necessary for the enemy war effort.

Subversion includes anything from individual sabotage to assassination, rebellion, revolution and secession.

Cooperation is particularly important in the case of the occupation of enemy territory.

Disclosure of secrets is a form of either subversion or cooperation if voluntarily undertaken by enemy nationals, but may be regarded as an independent objective of the war effort against the enemy if it occurs involuntarily and is not induced (by psychological or other means.)

The principal objectives, which we try to reach in times of peace differ, of course, from war time objectives. Annihilation, unconditional surrender, the acceptance of peace terms, and the surrender of enemy contingents are no peace time objectives. As regards all other principal war time objectives, it may be said that there are peace time objectives which

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closely resemble them, particularly in "coldwar". In addition, there are certain other peace time policy goals which are unlike any of the policy objectives mentioned above for the case of war, such as postponement of enemy attack, adjustment of divergent national interests by agreement, etc. I do not intend to discuss peace time objectives in any detail. Nor do I want to introduce at this point considerations of defensive war time objectives. Finally, I shall not complicate matters by an attempt to show how offensive war time objectives are being influenced by the fact that the enemy tries to reach, in war, similar or identical objectives.

Instead, let me say a word about the effective resistance of the enemy, which has to be overcome in order to reach the policy objectives.

Effective resistance, the effort to fight and to work, is dependent on the capacity to resist and on the will to resist. The capacity and the will to resist are in turn dependent on many factors, some of which are less easily assuageable and subject to change by the application of weapons (instruments of policy) than are others. Broadly speaking, both the capacity and the will to resist, and thus the resultant effective resistance of the enemy, can be lowered by deprivations inflicted upon the enemy and by indulgences offered to him. To the extent that we control such deprivations and indulgences, i.e. to the extent that they are neither "natural" (e.g. bad harvest) nor controlled by the enemy himself (e.g. by his policies), we can affect enemy resistance.

Deprivation may be said to comprise destruction of personnel and facilities, damage and maiming, denial of enemy areas by conquest, blockade or other means, threats of such measures, etc.

Indulgences include offers of peace terms that appear not unacceptable to the enemy as to parts of the enemy, restrictions of violence beyond enemy expectations, etc.

Perhaps the main problem of grand strategy is how to minimize effective resistance. It certainly is not how to maximize destruction. Maximum destruction could be a reasonable aim of grand strategy only if it were true without qualification that effective resistance is always lowered by destruction. This is obviously not true. We know of many wars, or phases of wars, in which deprivations inflicted upon the enemy, raised the enemy to more effective resistance.

In view of these considerations, it is desirable in war

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- (1) to avoid inflicting such deprivations (by the appropriate selection of targets and weapons) as will increase effective resistance.
- (2) to inflict only such deprivations (by appropriate selection of targets and weapons) as will decrease effective resistance.

Similarly, in times of peace, it is desirable to act in such a way, in respect to a potential enemy, as to lower his initial effective resistance in case of war. In all these cases the instruments of policy are used not for the purpose of maximizing deprivation but for that of minimizing resistance. In discussing unconventional weapons, we may want to bear these considerations in mind.

A last remark about the "will to resist". It may happen that the people's will to resist is weak, although the enemy's strong effective resistance does not reflect this state of affairs, e.g. when the government succeeds in forcing the people to resist effectively "against their will". In such a case, the people may, as it were, be more afraid of getting killed by their own government authorities than by their national enemy. In war against nations with dictatorial regimes, it would be especially erroneous to assume that lowering the enemy people's will to resist necessarily means lowering the effective resistance of the enemy. This erroneous assumption may be called the democratic fallacy, since it is true of democratic regimes that the will of the people influences the action of their government.

In choosing targets within a dictatorial country and in selecting conventional and unconventional weapons for use against these targets, it is therefore important not to fall victim to the democratic fallacy. Action against the military or civilian policy makers, or against the other leading groups on the enemy side may be more effective or equally effective (and more humane) than action against the masses of the enemy population. This may be so in a war as a whole or in particular phases of a war.

Mr. Goldhamer of our Social Science staff will now briefly outline a number of considerations which might be kept in mind in discussing psychological effects.

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CONSIDERATIONS FOR DISCUSSION OF PSYCHOLOGICAL EFFECTS

Goldhamer: I shall talk about "effects". On the agenda some seven headings are listed under "Effects", but no specification is given of particular substantive effects in the sense of anxiety, fear, rumor, disaffection from authority, etc. The list of effects contains those formal differences or categories which apply to almost any type of psychological effect. It presents particular categories for analysis which seem to be relevant irrespective of any particular psychological variable, such as anxiety or fear.

Speaking then of these more formal characteristics of the effects one might say, first, that the effects which one initiates are subject to more or less control. The controllability of the effects is a function, at least in part, of the target discriminability, or if you prefer, the target selectivity or the unconventional weapon that is used. Obviously, a weapon may do more than you want or it may do less than you want, or it may do what you want in places where you don't want it to have effects, etc. The capability of a weapon to be put to discriminate use might be examined with respect to space, time and population class.

Obviously some weapons may lend themselves rather readily to the production of short-range effects. These may be in fact the effects which you wish to secure, but may have also long-range effects which are undesired. In such case there would be a lack of controllability or discriminability in the weapon you are using. As Mr. Speier already indicated, the long-range effects following short-range effects may to some extent negate the value of the weapon. Of course the reverse might happen. It may be that the long-range effects are desired, but the short-range effects are undesired.

Psychological effects can also be reversible or irreversible. That may also impose a limitation upon the use of the weapon and indicate a lack of its controllability. Irreversible effects are perhaps undesirable, since they restrict our freedom of future action, but may nonetheless have certain compensating advantages. An effect that cannot be reversed by us will in many cases also be irreversible from the standpoint of the enemy. It is possible, however, that an effect which we cannot undo may not be irreversible from the standpoint of the enemy.

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Some psychological effects may be sustained and others may be relatively brief. If they are relatively brief, sustained dosages of the action may be required. If sustained dosages of the action are required, however, another indication of a possible lack of controllability emerges. The brief effects may have a high adaptivity coefficient, i.e. people may adapt themselves rather readily to the effects, so that repeated dosages of the effect become of decreasing significance in terms of the effects one wishes to retain. How to overcome adaptivity responses may therefore be mentioned as a research problem of importance. Timing in the use of weapons would be relevant there; experiments in psychology show that timing is fairly important. Also, variations in dosage strength of the relevant action may be important and perhaps even more so, the admixing of new elements to the former action merely to prevent speedy adaptation. I have the impression from the literature on bombing that the astonishing adaptation of the European populations to bombing really indicates a gross psychological inefficiency of the bombing procedure.

Some psychological effects may show negative adaptation, i.e., the effect may become more pronounced as time goes on. The negative adaptation or the intensification of effect may progress even though no further action is taken; the initial action only sets off effects which accumulate in intensity as time passes. Other effects may also intensify despite equal dosages. Finally, there may be instances in which intensification increases even though the dosage gradually decreases.

It also seems to be relevant with respect to the time dimension that some effects are latent and others immediate. One might speak of latent effects when no further action is required in order to bring them to maturation. Other latent effects may require a trigger action to bring them to the overt stage. Certain latent psychological effects that we wish to produce may be underestimated: since we don't see them, we assume that we have failed. Or later trigger actions merely used to bring them to the overt stage may be considered as the real causes of the overt effects.

Let's look at some of the problems of controlling psychological effects with respect to space. Here also the weapon may be relatively discriminating or relatively non-discriminating. Maximum control exists when the place of effect can be designated. Other spacial aspects are with respect to the diffusion of effects. Some psychological effects may be restricted to the area in which the action occurs.

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Others may diffuse but with varying speeds and with varying degrees of dilution as the effect spreads. Diffusion of effects will be dependent on their communicability, on the mobility of affected persons, etc. It is important to note that there are three special cases of undesirable areal extension of effects. There may be an unintended extension of effects (1) within the enemy area itself, (2) to neutral areas, and (3) to our own area.

We might think of space as simply representing that population which occupies a particular area, but there are other population classes which are not spatially separated. In the latter case the specific discrimination capacity of the weapon with regard to population class becomes important. Weapons may be valuable which can be used discriminately with respect to elite or mass, to military or civilian population, children and adults, men and women, rural and urban populations, etc. If an unconventional weapon had a relatively low specificity with respect to target selection, one would have to take into account the possibility that its effects will be different on different classes. And the advantages that you may gain by virtue of the effects you produce on one class may be offset by the disadvantages arising from the unintended effects produced on other classes.

Now a word about the relevance of "knowledge" of effects. There may be desirable effects of which we know little or nothing. Perhaps that isn't too important. It should be noted, however, that intelligence about the effects may affect your planning of further action.

The non-use of weapons as well as their use may have psychological effects. Non-use may be understood to include restrictions of use. There may be some unconventional weapons whose maximal effect might be available simply on the basis of sheer knowledge that the weapon exists. Obviously these aspects of unconventional weapons are closely related to problems of communication and timing. The effect of non-use of a weapon would imply that the weapon is used communicationally.

There is one class of unconventional weapons that cannot be used at all, namely unconventional weapons that don't exist. Non-existent unconventional weapons, however, can still be used propagandistically for the purpose of producing effects, such as terror. Interesting problems arise in this respect since with the rapid development in military "technology", there is perhaps an increasing predisposition to assume that all sorts of things exist that do not exist. Perhaps this class of non-existent weapons may be even more powerful than those that do exist. Imposing too much on the credibility of people, however, may have a boomerang effect.

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Another heading is the relation of communication policy to the attainment of psychological effects. There seem to be two stages worth distinguishing: (1) communication policies affecting communication prior to the use of the weapon in peace and prior to use in time of war; (2) communication acts which accompany and follow the use of the weapon. The communication acts following the use of the weapon are probably more important since many of these weapons are "unconventional" and therefore require interpretation to the target populations. These people are experiencing something, but given the unconventional character of the weapon, they may not be really very sure what it is they are experiencing. They may be open to a great many interpretations and these interpretations in fact may be very important in maximizing the effects of the weapon itself.

Now one final heading which is closely related to communication policy: credibility. Any unconventional weapon we discuss can be spoken of as being more or less credible for a given population and for a given communications policy. The effects of an otherwise powerful unconventional weapon may in fact be considerably diminished if low credibility is attached to it. The low credibility would not perhaps affect those who have been immediately subjected to attack by the weapon, but it would influence the diffusion of news and rumors within the enemy nation as to its effects. People may discount what they hear and in that way diminish the effectiveness of the initial use of the weapon. There is the possibility that the effect of a given unconventional weapon might be diminished if a prior exaggeration exists with respect to its capabilities. That brings us back to problems of communication and, whether in connection with specific weapons, one wants understatement, exact statement, or overstatement.

There is the further question of direct and indirect methods of studying effects. The possibility of direct study of unconventional weapons is perhaps fairly limited in a context which is likely to be historically significant for ourselves. There are possibilities of studying analogous situations and possibly extrapolating the results. But to think of direct study in the sense of really studying effects in connection with a particular enemy, the possibilities are extremely limited. However, let me just by way of example, although it doesn't involve an UW, indicate what sort of possibility there is.

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There is the "Voice of America." The Voice of America is producing certain effects in which I include also the class of non-effects. This is no artificial situation. If we had adequate intelligence on the Soviet Union, presumably we could do a study of the impacts produced by the Voice of America. It involves a country in which we are very much interested and involved a weapon which, although not unconventional, might be associated with certain unconventional weapons. Such studies made now may also have, by extension, applicability to war time contexts, although we would get on somewhat shaky ground.

The second general class of methods involves the use of historical parallels. Unconventional weapons are not, as Dr. Speier indicates, unique to our own period! You have the memorandum on the V-2 in Germany. That's a very clear cut historical parallel and I suppose one could reach back in time and study everything from the first introduction of elephants as mobile forces, up to V-2. Unquestionably a good deal of suggestive material can be secured. The limitations of extrapolating results are obvious.

A third general method of study was also referred to, namely the study of peacetime disasters. Now that also is open to the objection that it is very different from the context of war, and that the study of peace time disasters in the United States involves Americans and they are very different from anyone else, etc. Yet there are sound theoretical grounds in which one can quite justifiably study the response to such disasters. Human nature is not (despite the fashionable cultural relativity) so completely divergent from place to place as to render such studies useless. Of course they have even more relevance from the standpoint of defensive measures against unconventional weapons which others may use against us.

Fourth, there is a good deal of literature which, for lack of a better term, I simply call theoretical or academic literature which is often what we would have no fall back on. For example, there has been talk of using noise as an unconventional weapon. It would be very hard to conduct an experiment in which you get one of these contraptions out over the Caucasus or even over the United States and try to scare the wits out of people in order to find out how really effective it is. But one can refer to a certain amount of academic literature on adaptation to loud sounds, to various pitches, etc. These experimental studies are not quite in the same context in which an unconventional-weapon would be used, but they are relevant.

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Finally there is a great deal of sheer descriptive material that is relevant -- anthropological or sociological -- about how people in different parts of the world think, act, behave, and what they seem to like and dislike, what their religious beliefs are, etc. The moment one thinks of producing a given effect, questions are raised as to what sort of people are these on whom you want to produce the effects.

I'm quite sure that from the standpoint of proper canons of scientific research many of these methods are highly unsatisfactory. The problem is not simply to worry about that, but rather to try to exploit to the fullest the available materials and methods, however imperfect they may be.

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JANUARY 26, 1949, MORNING SESSION

Lasswell: Goldhamer's presentation of the dimensions of a possible study of the psychological effect of unconventional weapons was useful. Such a study might be undertaken from two points of view. One possibility -- which Mr. Goldhamer seems to have envisaged -- is to explore the potential effects of given unconventional weapons in specified situations. The other would consist in examining the unconventional opportunities which might be inherent in any kind of situation; then one could mobilize all instrumentalities that can be discovered.

Brodie: It would be desirable to attempt to the best of our imaginative ability to envisage all conceivable kinds of circumstances and all types of unconventional weapons that might be used; but at the same time, we should also try to define the probable limits to the use of unconventional weapons. I am thinking in terms of what economists call the "opportunity cost." For instance, agents might use gas for purposes of sabotage; but it is problematic to what extent this technique of sabotage would be employed rather than another. We have to envisage the economic aspect of strategy.

Ridgway: A more specific consideration in this connection: Bickett in his book, Military and Political Consequences of Atomic Energy, and Elmer Davis in an article in Harper's Magazine (January 1949), suggest that a strategic air force would be useless to the U. S. in case of a war against Soviet Russia, because in fact it would never be used. Since the Soviets would occupy all of Europe, the only accessible targets would be occupied cities of friendly nations which we would not desire to bomb. I would like to hear any comments about the sanity of this argument.

Rostem: I would like to raise a question about the scope of this conference. Are we restricting ourselves to the discussion of methods of studying the psychological effects of unconventional weapons? It appears from the first statements that you are particularly interested in setting up certain generalizations as a framework for studying psychological effects.

Staier: You stated the main objective of the conference correctly; but no question is ruled out, although some might be tangential.

Leites: I agree with Mr. Rostem that methods of research into psychological effects are best studied in the context of certain substantive problems. In this respect, taking up Mr. Lasswell's suggestion, we might start from the analysis of the effects of existing weapons, but then consider the additional problem of what would be the required weapons. We might be able to set up a model situation concerning the Soviet Union and specify required weapons. Then we could study methods of procedure.

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Stachan: I was impressed by the fact that all presentations so far placed greater emphasis upon the offensive rather than defensive use of unconventional weapons. The two problems are different -- we are dealing with a different class of problems when we discuss the weapons we might use, and when we discuss weapons others might use against us. Another question is whether we should study concrete uses of weapons in technical detail or rather some general problems, as was the case in the opening discussion. We cannot do both adequately. Also, unconventional weapons are always used in conjunction with conventional weapons; strategy will have to correlate the two. The whole distinction is a matter of degree, as unconventional weapons tend to become conventional; the dichotomy between the two is not very reliable.

A further dimension I have in mind is whether we shall consider only specific devices, or rather unconventional tactics in using possibly conventional devices. Shall we consider, for instance, the use of surprise? Or innovations in the combination of weapons, such as the use of rockets launched from submarines? Or the combination of diplomatic deceit and attack, as in the case of Pearl Harbor? If we concentrate upon hardware, we may overlook tactical combinations. There are some known methods which are infrequently used, such as the use of hostages, or underground activities. These may be important if friendly territories are occupied by the Russians. Unconventional methods of deception were more important in the last war than in earlier wars, and could be developed more. Cover operations and camouflage may be developed in a more sophisticated way than hitherto. Expectations about how the war develops and how the enemy will behave play an important role in every war, and important surprise effects could be achieved by generating such expectations and then suddenly changing one's behavior. Thus, unconventional behavior may be just as important as unconventional weapons.

Davison: We could allocate some time, if the agenda permits, to setting up a situation in which unconventional weapons are used. One team then would wield these weapons, another would try to develop a defense, and an umpire team would evaluate the effects. This might be a good way of reaching conclusions.

Salznick: It seems there is too much readiness to consider unconventional weapons merely as novelties or departures from custom. But there may be an essential distinction involved, -- today's unconventional weapons may be inherently outrageous in their effects, in a way in which unconventional weapons in the past were not. If this is so, studies of the psychological effects of unconventional weapons in the past would be of no particular use. Does the atom bomb not belong to an altogether different dimension?

Lion: Just a small point suggested by a comparison between the Janis reports and Mr. Goldhamer's statement. Unconventional weapons may have an important effect upon home morale, e.g., if their potentialities have been exaggerated. When they turn out to be not quite so good, the bad effect on home morale may be quite serious.

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Leites: Although the time may have come to use Occam's razor against further distinctions, the discussion thus far seems to suggest we may make a threefold distinction among unconventional weapons. We may distinguish (a) technical novelties, new inventions which depend on progress of science, (b) devices of deception, or novel tactics, as mentioned by Mr. Stephan, (c) extreme weapons which have the "outrage" effect mentioned by Mr. Selznick.

Sosier: I think "extreme" weapons as defined by Mr. Selznick would also come under category (1), "inventions."

Leites: Yes, the categories overlap.

Boston: May I return to the question I raised originally? Do you want us to map areas of research in the non-hardware effects of weapons? or imaginative accounts of techniques in using unconventional weapons? or a methodological analysis? What will our final report be? A series of propositions, or a list of research projects? Or do you want us to indicate general areas that might be emphasized in future research? Or shall we think up some unconventional weapons?

Sosier: If I may answer this off the bat, I think it would be most profitable to think of the result of this conference as a series of suggestions for feasible research projects. Now if you try to do this, you inevitably get into the discussion of some unconventional weapons about which there exists no literature. Instead of studying the psychological effects of existing weapons, we might also consider the psychological effects of something we herewith invent. For this we may go back to points made earlier, and set up model situations involving the Soviet Union. But it would seem to be most useful to think of the ideal result of this conference as a summary of a number of research projects which you think are both important and feasible and on which you might indicate certain methods that might fruitfully be employed.

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A MODEL OF FUTURE TRENDS AND U. S. GOALS

Lasswell: I have some doubts as to whether it would be best to proceed in this way. I think it would be stimulating and rewarding to spend some time sketching our major expectations concerning the future course of world politics. We could specify two or three major lines of expectations and outline policy objectives we would like to achieve. It would take some time to outline such a model. If I were to present such a model and heard it evaluated by a number of persons, I could certainly be in a position to suggest a number of unconventional weapons to attain the objectives set. Then I would be in the thick of either inventing unconventional weapon possibilities or suggesting useful lines of research.

Hall: I personally would like to see discussion proceed along these lines.

Ridencour: Could it be fitted into the agenda?

Spoier: We may well change the agenda in this sense. If we did this, we could also take care of some of the comments that have been made in the discussion. I think Mr. Brodie's point that we should consider the range of probability of the use of unconventional weapons should be considered as another attack on the points also made by Messrs. Roatson, Lasswell, and others. Any further comments on the agenda?

Williams: Just a small point. It seems that in outlining war and peace objectives, you tacitly assume that you will not be interested in such objectives as destroying the enemy, or inciting him to go to war. There have been examples like Carthage and others of this kind.

Goldsen: That point could be taken care of, depending on the type of assumption you make as to future expectations. Since we are considering unconventional weapons, the discussion should point to the future almost by definition. I would also suggest we do not take an undue amount of time refining this preview of the future in every detail, but rather set up what Mr. Brodie called a working priority classification of important subjects. For example, one major expectation might be that as a result of what happened in China, the Russians have revised their timetable about the inevitability of war, and may now concentrate upon reaching maximum war capacity in, say, 1980 rather than 1952. If we introduce such an assumption, one of our objectives may be to minimize the industrial development of a huge continent -- the integration of China's economic potential with the Soviet Union. This opens a sensible discussion of unconventional weapons best suited to this purpose.

Hall: To clarify Mr. Goldsen's remarks: it would be good if someone presented such an anticipated picture; otherwise we would get disjointed fragments. Perhaps Mr. Lasswell could do it.

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Jania: I heartily endorse the proposal that a model of the future be set up. But if we do so, we should fix our attention as much as possible upon the kind of manipulable responses which are most relevant under the circumstance we think are most likely to occur. To take an extreme, unrealistic example: If we expect war to break out only when both sides are armed to the teeth and are capable of inflicting a very decisive blow in a short time, then certain types of withdrawal from cooperation (as a psychological response) do not matter; it makes no difference, for instance, how efficient the workers are, as long as certain insulated sectors of war-making potentials are intact. In such a case, other targets will be more important. I propose that at each step we focus our attention upon the kind of effect which would be most important if the model were true. This will help us formulate our research projects in the best way.

S tephen: It seems to me it would be possible that the discussion might be oriented to the psychological effects of unconventional and other weapons and in general towards the participation of the civilian population. This makes the problem primarily a psychological one. The reason why the effects of unconventional weapons may be stressed is that their psychological effects are not so well known; the element of novelty itself may be psychologically important. There is no clear line of demarcation between old and new tactics. The psychological effect always depends on the total situation. The effect of atom bombing, for instance, may be different upon a population that has already endured incendiary and high-explosive raids. It is also possible to consider the effect of unconventional weapons in terms of retaliation - what retaliatory measures the enemy might take, or how we would retaliate if the enemy used unconventional weapons. One psychological effect might be the fear of retaliation. Finally, we could consider the technical problems involved in the use of unconventional weapons - this is an entirely different type of subject.

Collbohm: I would stress the word "psychological." In World War II, the major military effort was directed towards winning the war by destroying the enemy's economic resources, and it is now generally recognized that this procedure was inefficient. We destroyed more than was necessary to gain our objective. The real objective was to change the attitudes of the masses and of ruling groups. Next time, it may very well be a change in the attitude of those who will be the ruling group after the war is over. The psychological objectives are paramount, whether in hot or cold war.

Leites: I would like to make a practical proposal. It is often fruitful to alternate between a "crude" and a "refined" approach. Could it be acceptable to start with a crude assumption of war with the Soviet Union in 1953, without elaborating upon the changes that might occur between now and then. The question would be what unconventional weapon possibilities would be available in 1953. After discussion, perhaps Dr. Lasswell or others would refine our model.

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Keeskemeti: In studying the psychological effects of unconventional weapons, it would seem to be useful to distinguish between two kinds of affects already touched upon in Mr. Goldhamer's statement -- affects which occur in any case without leading to surrender, and the crucial affects which change the total situation, and bring about a significant reorientation of the enemy's thinking.

Goldhamer: With respect to setting up models, I would suggest that the set of conditions which exist now are obviously the best known. Laites made the suggestion to set up a model for 1953, and later the models may be switched to even later dates. But this always involves the question of plausibility, and if it is found in the discussion that certain assumptions are not realistic, the models must be altered or shifted.

Goldsen: There is actually no great danger that our suggestions will be inappropriate because of the "wrong" choice of our date. In world politics there is always some expectation of war; the expectations may be high or low. In this respect, then, we have two alternative procedures:

- (1) We can assume a cold war situation with a high expectation of war, with the actual outbreak of war depending on Russian calculations of their chances of victory and optimum relative strength. In this model, we have to do with a race towards weapon parity; it may be quite a long term model. Our subject may well be the study of unconventional weapons to maintain the present superiority of the U. S., and to prevent a closing of the gaps without going to war. Capt. [initials]
- (2) Assume that war has begun. For this, 1952 seems too close; we might choose 1960 or '70. The model would set a framework for original thoughts. Capt. [initials]

Lisswell: We shall get farther if we adopt the most inclusive space-time model. I say this because the moment you assign an order of relevancy to your efforts, you have to assume a very complex structure of aims, goals and identifications. Unless we expose ourselves to the clarification of our long-range policy profile of preference, and expectations, we cannot discuss our policies in an articulate way. Therefore it seems best first to set up a rough model of long range objectives and expectations - and then introduce specifications. Otherwise, we shall be left with dangling uncertainties about whether others share the same expectations.

Laites: I would be entirely in favor of what Lisswell said, if we did not to consider the limitation of time. I feel we should restrict the pre-model phase of our discussion to half an hour or an hour; the chairman should set a deadline for arrival at the post-model stage. To have some model is better than no model at all.

Speier and Goldsen: (second)

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Coale: I would like to make two points about the model: We should study the nature of war if we assume war, and the nature of peace if we assume peace. War is different, for instance, if we assume that our potential is heavily mobilized at the beginning than if we assume that it is not mobilized. Then we should also examine the problems with reference to various nations. The same event will have different psychological effects in America and in Russia. In the Soviet Union, the manner by which information is distributed is different; also the aim might be the destruction of the elite.?

Schaefer: Any other comments?

Young: A minor point. You have talked about the political framework - but you also need a weapons framework, since you are going to talk about weapons. What are the criteria for the use or non-use of a weapon? What are the technical possibilities? These frameworks will narrow down the field of discussion.

Lesswell: It is important not to allow too much importance to the term "unconventional" in this discussion: Mr. Stephan has also made this point. I would suggest the following formula: It would be useful to speak of the "weapon consequences" of any instrument of policy. This means the actual or potential deprivation which a weapon can inflict. Then we may ask: What are the "weapon consequences," say, of a diplomatic offer made information: Unconventional weapons may be studied in this framework.

Leitner: Mr. Coale suggested that the elimination of the ruling group might be an objective. But does this belong in the "model"? We might assume a state of war with the Soviet Union as a "model" and then immediately proceed to discuss tactical objectives, unconventional weapons available, and the like. Thus discussion of the model could be combined with the application of the model.

Stephan: It makes no difference whether the model as such is accurate; if we are interested in the capabilities of weapons, then the necessary lines of research will be suggested by the weapons requirements of the model. All weapons have psychological effects; every weapon is partly hardware. The psychological aspects have largely been ignored in the past. Bullets also have psychological effects; and they might be used to deliver a "commercial." Mr. Goldhamer has commented on this point. Secondly, every weapon has psychological effects prior to its use. It is one of the striking aspects of the application of the atom bomb that it has been used without exploring other possible uses. One possible political strategy consists in not announcing any terms for surrender until the enemy is so weakened that he accepts any terms; another strategy would be to announce one's goal right at the beginning of the hostilities. We might lay down the lines along which we want to discuss psychological strategies.

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Lasswell: I propose that we spend 45 minutes on a gross model of the future: our political objectives and major expectations. The presentation of the model should take 15 minutes, followed by 30 minutes of discussion. This will give us a framework for further speculations.

Spicer: There seems to be unanimous agreement with this procedure, although the time limit of 45 minutes should not be rigid. Various modes of discussion have been suggested, and I do not want to add any more comments, except that we can have no discussion unless someone presents a model. I suggest that Mr. Lasswell, if he can be prevailed upon, opens our next session with the presentation of a model. In the discussion, we should keep in mind Mr. Brodie's point, and pay special attention to the range of probability of the application of conventional and unconventional weapons. Furthermore, in connection with what Mr. Stephan said, I would propose that we examine all the psychological effects of weapons, and not only the "non-hardware" effects. My understanding is that hardware weapons have psychological effects, and so do non-hardware weapons. Even a bullet not accompanied by a "commercial" has a psychological effect upon the survivors; the message may supplement this, and a message may also be delivered by a "non-hardware" instrument. Was this what you suggested, Mr. Stephan?

Stephan: Yes, I do propose to focus our attention upon the psychological effects of weapons rather than their tactical application. We may make a further distinction between the immediate psychological effects of direct contact and the remote psychological effects; then we have to take into account all circumstances, anticipations about the course of the war, and so on. We might bog down in detail if we tried to consider all this. We certainly cannot discuss specific immediate effects in a technical manner. But we could devote part of our time to the consideration of immediate effects, and another part to the whole psychological context - effects upon resistance, readiness to surrender, and so on.

Spicer: If I may go on with my concluding remarks: We should deal with the defensive as well as offensive aspects of unconventional weapons, - with what Mr. Lipp said about effects upon the home front. Mr. Davison's suggestion about war games may be dismissed at this point; this procedure may turn out to be inappropriate later. Mr. Selznick has suggested that certain unconventional weapons are "extreme" in their "outrageous" effects. Do we mean that they should be ruled out entirely on this account? Or is this merely a terminological distinction? I certainly should not want to exclude them from the discussion.

Selznick: I did not mean to exclude them from the discussion: the distinction was meant as a terminological one.

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Spicer: It is easy to overestimate the outrageous effects of modern unconventional weapons. The psychological outrage caused by the introduction of fire power, for instance, paralleled the outrage felt following the application of the atom bomb, and the fact that nobody now feels outraged by the use of fire power may well be due to the fact that our whole civilization is an outrage. I would feel disappointed, and so would others here present, if our discussions during this three-day period were limited to the problems suggested so far. We are interested in having an informal meeting about the satellite vehicle, and other informal meetings about unconventional weapons may follow. But I do not want to prejudge the course of the whole meeting. In any case, we would like to have your comments -- formally or informally -- on the psychological aspects of certain unconventional weapons, especially the satellite. I do not want to disparage the discussion set for this afternoon; on the contrary, I am very happy that we shall go into these matters; but there are other points we shall have to consider later on.

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JANUARY 26, 1949, AFTERNOON SESSION

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"MODEL" OF FUTURE TRENDS AND U. S. POLICY GOALS

Lasswell: I shall present my model of the future in the style which is used in weather forecasts, where all qualifications such as "it is possible that...", "it is probable that..." are eliminated. Now, in talking about the future, our first question is this: What policy goals shall we assume as being shared by all? I assume that we are interested in moving toward certain policy relationships (on which there is broad agreement among influential people in the United States) — these, then, will be considered as the "goals" on which our model will be based. The state of the future which is our main goal, or policy objective, may be described as a "free world community". Such a community is characterized by the sharing of certain values among the whole population of the world. What we wish to achieve is sharing, rather than concentration of values in the hands of a few privileged groups. In order to implement the sharing of values, certain institutions are needed. I now shall spell out a list of values which are to be shared in the Free World Community, and specify the institutions needed to share and share these values.

Here is the list:

<u>Value</u>	<u>Institution for sharing</u>
Power	Order, democracy.
Wealth	A rising standard of living and a balanced (rather than highly concentrated) distribution of income.
Respect	The absence of all discrimination on grounds other than merit, such as racial and religious discrimination; equality of access to values.
Enlightenment	Sharing of skills; free flow of intelligence and information as a basis of rational decision.
Well-being	Guarantees for the bodily integrity, and for the development of integrated personalities.
Rectitude	A substantial concordance as to standards in terms of which "rightness" of actions is assessed.

This list might sufficiently indicate what we mean by a desirable world community. It has immediate application for all our policy activities. For one thing, it means that we have great reluctance to adopt measures that annihilate people. We have respect for the dignity of man. We prefer to achieve our ends without destruction.

The list has implications concerning (1) demands, (2) expectations, (3) identifications.

As to demands: if the world commonwealth is to be realized, there must be an effective demand for it on the part of the policy-makers.

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As to expectations: A supporting structure of future expectations must be maintained - the expectation that as we move towards the Free World Commonwealth, the excess of indulgences over deprivations in terms of all the values sought will be maximized.

As to identifications: There must be a very considerable degree of identification of persons with the world community, so as to strengthen the "effective demand" and the "expectations".

So much for policy objectives. Now let us make a few postulates about the state of world affairs and the visible future. We shall postulate a high degree of expectation of war, and, furthermore, a bi-polarization of the structure of power between the U. S. and Soviet poles.

In our model, let us assume that starting from this state of affairs we shall move towards the resumption of cooperation without war. In this process we shall distinguish three periods.

Period 1 will end about 1952; at that time, there will be general agreement among decision makers in the U. S. that the Soviet Union has achieved sufficient weapon parity to inflict destructive blows upon the U. S.

Period 2, 1952-62: This period is characterized by a high expectation of violence at any point; this leads to an allocation of resources within each country such that freedoms which survive in the Soviet Union and freedoms in the United States are considerably diminished. That is to say, in this period we move towards the garrison (police) state.

Period 3. Beginning at 1962: characterized by a steady resumption of acts of cooperation.

For our purposes it is especially important to specify a structure of expectation which can maintain activities short of war within this period on both sides, and increase the possibilities of cooperative action.

One of our major policy objectives can be so to use all resources available to us as to maintain a structure of expectations favorable to the preservation of the possibility of resuming cooperation. In the meantime, however, it is generally realized that a shooting war may erupt at any point.

For the examination of the weapons implications of our policy goals, we must chose a starting point. I propose to exclude as a starting point the possible use of "doctrinal" weapons which might be distributed in America and the accessible world - a stream of propaganda and information, underlining the probability that Marxism and Liberalism as well as myself that the intellectual problem of our time is communism and liberalism versus the probability either of the annihilation of humanity

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or of the consolidation of the garrison-prison state - one or several - throughout the globe. This implies that Marxist analysis was incorrect in that it has underestimated the annihilative implications of the application of modern science to technology. Marxism envisaged war and revolution as the means of inaugurating the free men's commonwealth, whereas under modern conditions war and revolution would either result in annihilation or in the advent of the garrison state. However, I do not propose to start the discussion with this. Such a fundamental ideological analysis is itself a possible psychological weapon, but I think we should rather discuss other weapons first.

I suggest also that we exclude as a starting point for our discussions the economic instruments available to us. I am sure we can invent new ways of handling economic relationships at home and abroad, but we should not begin with this since we lack a good deal of common equipment in this respect. Third, I suggest we exclude as our starting point the diplomatic weapons - offers, counter-offers, negotiations. Such weapons and combinations of weapons are possible, but we should leave them to the side at this point.

Our starting point should be a fourth group of weapons, namely arm's instruments commonly regarded as capable of causing destruction. If we begin with hardware, one of our first questions will be: what type of hardware weapons would give the maximum effect upon the long-range assumption of reoccupying. One suggestion in this connection would be how to get full access to the population of the Soviet Union (Mr. Lees mentioned this in his morning session). Secondly, I would suggest that omnipotence weapons, even if we could invent them, would perhaps be unwise. By this I mean weapons which would give us such an excess of power that we could tell the slits of another country: Either you accept guidance from us, or we will deny you vast quantities of territory or destroy most of your population. The feasibility of this would be doubtful, partly due to its impact upon our own government and our society. The reaction of some elements in the U. S. might be this: Let's use this weapon to restore private property in the Soviet Union; or, to make an ultimate demand for the restoration of capitalism. Or, the excesses of omnipotence would be raised upon us as an opportunity to maintain our special forms of white supremacy. That is, there is a grave danger that an increase in omnipotence would sharpen up the internal cleavages in the U. S.

Blanchard: Would you make it clear whether you mean a relative or absolute position of omnipotence?

Lesswell: Absolute omnipotence would indicate better what I mean. To sum up: our problem is to maintain expectations on the part of decision makers that more is to be gained by cooperation than by effective resistance, that is, either actual fighting

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or preparations for war.

This is the sketch I present for discussion. This model implies a high expectation concerning the possibility of war, and a very grave crisis; but it avoids war and establishes a future situation in which cooperation is resumed.

Seier: Any comments?

Stephen: This is an important statement, because it gives us a framework and even more, a set of objectives for possible action. The question is what action would be optimal to achieve that goal? However, before discussing this, I wonder whether we have an objective that is adequately specified to permit an examination of ways in which it could be attained. For instance, is the term "cooperation" sufficient to define our objective? There are many possible ways of cooperation, and some of them would be rejected by us. The differences between proposed sets of cooperative relationships might be considerable. Could you amplify on this point?

Lasswell: I assume that our longrange objective, the Free World Commonwealth, includes the continuation of the situation in which the U. S. is free from externally imposed conditions. It would mean we take for granted the continuance of American institutions - that no ultimatum from the Soviet Union will force the setting up of new institutions more satisfactory to Russia, as an alternative to annihilation by an instantaneous weapon they allegedly have. It would seem to be necessary to indicate, not only values and value-starting institutions, but also certain limitations on political influence and coercion.

Stephen: The purpose of Mr. Lasswell's presentation was to anticipate a lot of things we might want to discuss, such as values and goals. May I suggest that we follow this up with a weapon model? If we want to convince the decision makers in other countries that cooperation is better than war, we must consider the psychological effects of various weapons - their utility for this purpose. Let us then concentrate on the psychological effects of hardware. Instead of elaborating on the model, let us say that we agree on our values; we agree that there will be a danger of war between now and 1962. We shall maximize the probability of non-war in this period if we use our instruments skillfully. What are the weapons the psychological effects of which we are to discuss?

Seier: If I may take time away from you, may I ask for clarification of one point? I took Mr. Lasswell's model to imply that there will be no war within a certain period, although there is a high expectation of war. But I wonder whether this sort of model is most suitable for our discussion. I recognize the great value of Mr. Lasswell's exposition of policy objectives, but

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I think it would be best to change the model arbitrarily and assume that war does break out. If it is true that during the non-war period we ~~choose to~~, and do not destroy our ~~values~~, it will become a question whether this reluctance will not be overcome temporarily in the war situation.

Also, if we assume that war breaks out at a certain moment, we may want to specify somewhat more precisely what conditions will exist at that moment. For instance, where will be the Russian bases? On which side will Central Europe be integrated politically? On which European alliance can we count?

Williams: If we put the time of war in the middle of that period, we can have our cake and eat it. We may consider the effect of weapons as deterrents of war as well as their actual use.

Stephan: Should we not consider this problem in terms of contingencies rather than rigid assumptions: There is war if certain developments take place, no war if they do not, and so on. There may be a minimum form of cooperation which you may call isolation - a minimum intercourse between two parts of the world which both sides might prefer to additional sacrifices of ideological or other values. Or else they may desire high-level cooperation. The question is whether we should discuss the effect of weapons upon the probability of war or of high-level cooperation or of isolation.

Leites: Mr. Rosten convinced me that the best thing would be to utilize Mr. Lasswell's model in discussing some particular weapon, and also some particular situation. Mr. Stephan made the important point that the period after 1962 might be one of permanent alert rather than cooperation in the good sense of the term. But it seems that we cannot do justice to our agenda if we try to construct all possibilities and then see the bearing they have upon weapons. On the other hand, it would be quite feasible to discuss a certain specific weapon, and include in this discussion references to certain situations in Central Europe, to a possible permanent alert, and so on.

Spaier: All right. But let us clarify one point. In discussing specific weapons, should we make explicit whether we assume war or peace?

Leites: I assume that when, e.g., Mr. Ridgway speaks about weapons, some of his sentences will imply the effects of use and hence a war situation; or the effects of threats to use, and hence a non-war situation.

Lipp: Since Mr. Lasswell's schedule shows increasing tension up to 1962, to be followed by a period of cooperation, we might consider the moment of maximum tension with the highest probability of war, and discuss the impact of a certain weapon at that moment - whether it throws the decision in the direction of war or away from war. I would also suggest that some time

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near 1962 be chosen, since the development of unconventional weapons will take that long.

Brodie: It seems that the difference between a cold war and a shooting war is significant enough. Hence we might profitably discuss each weapon in terms of two very distinctly postulated situations: one of high tension in which we want to avoid war; and one of actual war.

Goldsen: With one modification: instead of assuming high tension without war, we could seek how the probability of war during that period could be lessened. How can we utilize weapons - in being so as to induce an alteration in ways of thinking and to achieve our objective, a lower probability of war? The second assumption would be that war has broken out.

Sneider: May I try to reconcile the two statements made by Mr. Brodie and Mr. Goldsen? I understood Mr. Brodie wanted to examine high-tension situations and war situations separately. But the effect of weapons in a high-tension situation may either be that war breaks out or that tension will be lower. If we take the latter possibility into account, this would correspond to your suggestion.

Leites: The effect could also be continued high tension.

Lasswell: I think the discussion of any weapon would inevitably disclose all these variables.

Sneider: The 45-minute period set aside for the modal discussion is almost over. May I ask Mr. Lasswell to comment on the discussion before we introduce a specific weapon?

Lasswell: I think the point made by Mr. Brodie is very important and that we shall keep it in mind in our discussion. I feel that in any thorough canvassing of the effects of weapons, every conceivable future contingency must be taken into account. There should be explorations of many modals of the future, including a statement about the probability of war in each case.

ATOMIC WEAPONS

Sneider: May I then call upon Mr. Bidenour to launch this second phase of our discussion?

Bidenour: I feel a little inadequate to do justice to all recommendations, but I'll try. I think you want us to outline what I think are the capabilities of a weapon which we must maintain in time of peace because of the danger of war. And we are to discuss the best psychological and political exploitation of this weapon for the attainment of the objectives outlined by Mr. Lasswell. This I'll try do.

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It was agreed earlier that we should discuss the wartime use of atomic weapons. This, I assert, today is identical with the employment of a strategic airforce, because that is what the strategic airforce would do today; tomorrow it may carry other weapons. Today and during the current decade, it would carry atomic explosives.

To say a few words on the capabilities of a strategic airforce: I think it is capable of causing a large amount of devastation - almost at will - within a short time. I did not think of this so far in terms of an omnipotence weapon; each weapon is to some extent an omnipotence weapon, since it enables me to impose my will on you. The exponential advance of scientific technology since Galileo's time shows no slackening, and we now have a pretty fair omnipotence weapon in atomic explosives, and we shall inevitably have others. We may think of weapons which kill no people and destroy no buildings but simply put people to sleep; later they wakes up. This would still be an omnipotence weapon since it enables me to impose my will on you. It might be good if someone could say a few words over the radio which would put everybody to sleep.

Speaker: It happens every day. (*laughing*)

Brooks: All weapons may be omnipotence weapons to some extent, but it is still valuable to distinguish between monopoly possession and non-monopoly. We are in this position as regards the atomic weapon. I think Mr. Casswell had this in mind when he spoke of the omnipotence weapon.

Ridgmore: Still, the main thing is what capabilities a weapon has. If it is a good weapon, it is an omnipotence weapon; and as long as we are in a hostile and suspicious world, we are going to make the best omnipotence weapons we can. Maybe the atomic bomb is not as revolutionary as I think it is; but I think - and some people agree - that it is quite revolutionary. After the last war, people seem to have overestimated the possibilities of gas warfare. But let's see, what the atomic bomb can do. (One plane-loaded of atomic bombs is equivalent to 200 or 300 megatons of high explosives. This magnifies the destructive effect - provided you can get there and do accurate bombing when you do - to such an extent that in two days' bombing of Japan you could have equalled the entire damage inflicted on Spain by the Twentieth Air Force.)

Now consider this in combination with some facts about defense. Air defense - even more than other forms of defense, because of the high coordination necessary - has the property that time and combat experience is needed to make it effective. There are some good examples of this in the history of the last war. For instance, the first German day attacks on England were quickly reduced to the point where they became too costly and were abandoned; but not before great damage was inflicted. Then

came the night bombing - this also was countered in a few weeks, but again there was much destruction. Pearl Harbor is another example, although it was not followed up. In the case of the German V-1, six to seven weeks were needed to achieve 90% efficiency of defense. At Antwerp, defense crews who already had V-1 experience in England were used and the launching sites were known; yet two weeks were needed to reach a defense efficiency of 57%, and efficiency rose to 90% later; the Germans ultimately abandoned the attack, but much destruction was caused in the meantime in Antwerp.

Now you see the point: if it is impossible to have a good air defense right at the beginning, then a modern air force in a full-scale two-day attack can produce all the damage done with high explosives in the last war. There has been a lot of consulting of this issue, and Blackett in his recent book devotes about 4 chapters to it, obscuring the hell out of it. He simply does not raise this crucial point of initial defense. It follows for us that even if we work hard on our air defense, it will have this initial ineffectiveness that is characteristic of all defense. It is generally believed that air defense at first can do no more than produce a reasonable attrition to make it more costly to run a strategic air force.

This is my picture of the technical capabilities. If we have enough atom bombs, enough planes and enough bases from which to operate, and the indications are that we do, then in the first two days in the next war - the first 2 or 4 times we run such attacks - we could destroy all the major centers of population, all the large-scale military installations in Russia, or Central Europe, or elsewhere.

Now if this is the case, how shall we describe our intentions with regard to this weapon? How can we endow this thing - which apart from the capabilities I mentioned has little tactical use - with maximum psychological efficiency? Shall we describe its effects during the cold war - or under a more imminent threat of early war? or during a future war?

The problem is sharpened up by the fact that the Russians seem to assume that this weapon is useless to us because it would not be used in this way. Also that it would not be decisive because it would not win the war. I think too that it would not be decisive in the sense that one blow would not win a war, but it would in fact be decisive in connection with other measures. This was conclusively shown by the Bikini tests which demonstrated that it is possible to deny large areas for certain periods by exploding bombs under water.

Is this what you are interested in? I purposely did not talk about hardware aspects, such as carriers, or the size of

the bomb; I think that is irrelevant.

Speier: It appears we can go on from here to a discussion of the psychological effects of the weapon described by Mr. Ridenour - its effects in a high-tension period; or in a war period. What would happen if this talk were brought home to the Soviet leaders or masses - or if it were generally known in the U. S.? What would it do to the values outlined by Mr. Lasewall? It would be possible to raise more such points. Or we could start with the war situation - as you wish.

Ridenour: I would suggest we talk about the war situation. One question arises which I cannot answer: when is a war over? It has been argued that World War I did not end with the 1918 armistice; and it is entirely conceivable that World War II has not ended either. Now if wars can stop without really ending, then it is conceivable that one might be content to stop a war without pretending to end it. This may be silly - but if some madman in Washington decided that we ought to be isolationists really and leave the continent of Europe alone as long as it left us alone, then the use of atom bombs for a specific limited purpose of destroying economic capabilities would make sense. As long as we do not appear in Europe to be shot at, we can be reached only by highly advanced technical means which require a considerable industrial plant. What we are asserting now is that we would use atom bombs only in retaliation. If the same thing were done to us. There are some other possibilities. My guess is that a war in which we would be concerned would be a wholesale war in which all arms are used. We should employ atomic weapons in approximately this way.

Brodie: I would add one point to Mr. Ridenour's admiring presentation. First, as regards the effectiveness of the job: if all destruction is telescoped in time, its impact is bound to be greater, since no time is left for repairs. In the last war, the effect of bombing was not cumulative, but the effect of this short raid would be. Second, we might make a few useful distinctions. It does make a difference to the material use of atomic weapons (I am not talking about propaganda) whether we assume one or the other of the following four situations:

- (a) U.S. Monopoly possession of the bomb with few bombs at our disposal (the situation which existed at the time of Hiroshima and may exist now).
- (b) Monopoly possession with a large number of bombs - sufficient to achieve the results mentioned by Mr. Ridenour; this situation may never be reached, since our monopoly may be broken before it is. Or it may exist for some time.
- (c) Loss of monopoly but marked American superiority both in the number of bombs and the means of delivery -

a situation not quite as favorable as (b) but still decidedly favorable - perhaps even more favorable in some respects than (a).

(d) Loss of monopoly with no marked superiority. There is still a fifth alternative which I shall not discuss.

Boston: We may now tackle the psychological effects of this weapon if we agree that the picture presented by Mr. Ridenour is correct, one of the first psychological questions is this: Why has the bomb created no greater psychological impact on people? A further point: we need to summarize all that we know (there is a great deal about this in the material presented by Mr. Janis) about the comparative psychological advantages of weapons which maim, as against weapons which kill. The general military assumption is that the maximum psychological effect of a weapon is achieved when it is used to kill people. It is clear from World War II material that the greatest psychological effect of bombing was upon survivors who saw dead bodies, or mutilated bodies.

The reason why this question may be important is this: There was the assumption that the terrorlessness of the atomic weapon would increase 'anxieties about going to war. However, I would agree on the assumption that anxiety was decreased, because what it promised was instant death and a form of death over which the victim had no control, rather than suffering or anticipation.

Spiegel: The importance of the distinction between the psychological effect of maiming vs killing cannot be denied. However, the scale of killing may entirely invalidate what we know about these effects now.

Hitch: My impression is that the ratio of those killed to those maimed was about the same for atomic bombs and high-explosive bombs.

Ridenour: There is always bound to be a periphery in which people are maimed rather than killed.

Janis: This problem is important, but we have to differentiate between the situations with which we are dealing. In the situation after the weapon has been used, some of this material is relevant; it differs from the situation in which the weapon is used as a threat. The differential psychological effects of maiming vs killing are not the same in the two situations. In the situation after the bombing, there are the psychological effects upon those who have been maimed. In the threat situation, I have come across the anxiety-reducing effect of the threat of instant death which you have mentioned; people say they would rather be exposed to a weapon which would obliterate them and their family in one fell swoop.

swoop, than face partial survival. This problem is crucial as regards the psychological use of the A-bomb in a period of mounting tension.

Roesten: The psychological usefulness of any weapon may depend on the way in which we characterize it. If we keep on saying that this weapon is terrible because it may destroy all of Russia, that might be less effective from the point of view of preserving the peace than if we say it will not destroy them.

Laltes: Addressed to whom? — ???

Coale: I'd like to make three points, one of which is relevant to the last statement: An additional technical fact about the atomic bomb is that the number of casualties is greater in relation to the physical damage caused. It was disclosed by the Strategic Bombing Survey that if a raid by atomic bombs did the same amount of damage to a town as a raid by high explosives, the number of killed in the first case would be 18 times as high, and the number of wounded 15 times as high.

A second point is this: whenever we discuss the atomic bomb, we should discuss it within the framework of the structure of the various belligerent countries.

Thirdly, we must distinguish between the offensive and defensive aspects. The offensive aspect concerns the weakening of the enemy's potential of resistance; the defensive aspect concerns the strengthening of our own resistance, and the minimizing of deleterious psychological effects these weapons have upon our population. We should not lose sight of the defensive side of the problem - saving LIVES, reducing psychological effects at home.

Goldhamer: The discussion seems to have assumed that the weakness of initial defense automatically implies that saturation bombing should be resorted to in the early stages, or intensive bombing culminate in a very short period. But I wonder if this does follow in fact. Presumably if war has broken out, this shows that we have failed to convince the enemy of our superiority (I am confining my remarks to cases (b) and (c) mentioned by Mr. Brodie). If this is the case, could we not decide upon an alternative use of the atomic bomb to bring home our superiority without large-scale destruction? There would be a gain if by a demonstration raid we could convince the enemy that they were wrong in having permitted the war to begin; but if we fail in this, we may forgo the advantage conferred by the initial weakness of the defense. I do not know the answer to these questions, but this is the kind of question that has to be answered. What sort of research or speculation could tell us how Soviet decision makers would react to demonstration raids? or determine the chances of convincing them without huge destruction raids?

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Ridencour: I would think that a few demonstration raids might be run without the danger of making the defenses so good as to eliminate the possibility of further saturations. Secondly, it is possible with perfect safety to give warnings to people - to tell them to get out of a certain town. This would make a difference to the psychological effect of the actual use of the bomb.

Stephan: One question that occurs to me is the attitude of the American people towards the use of the atomic weapon. Especially if you start out with demonstration raids, you may create feelings of guilt and also a paralyzing indecision about how the weapon should be used, which might very seriously interfere with its use. The second question is whether the potential enemy would not employ a strategy of always keeping tension below the point at which we would use the atom bomb, improving his position step by step by this strategy. Could the enemy not neutralize the atom bomb, especially if he has other weapons which he could use in retaliation, or has political advantages he could exploit in negotiations with neutrals?

Lipp: I should like to return to the point raised by Mr. Goldhamer. One of the major psychological problems we have to worry about is that of convincing the enemy of what is going to happen to him if he starts a war. There must not be this business of starting a war and discovering later it was a mistake. He must know what danger he faces, and this must be accomplished without revealing to him the details of our technology. We must say what the effects will be and convince him that this is true.

Sosten: Why can we not give him the so-called secret?

Lipp: This would shorten the time in which he could catch up.

Braddie: Much of the technical information is in the public domain.

Lipp: I will grant his point: but still, the real problem is to convince them that we are going to use it on a certain scale.

Ridencour: Are we going to convince them only after the war has started?

Braddie: Mr. Goldhamer raised the question whether we can convince the enemy of the danger he courts after the war starts. I think it would be even more important to convince him before the war starts.

Collbohm: It seems there is something strange about this discussion, since we are talking about something in the future, where as it's an existing situation and we should be able to measure rat.

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than predict. For one thing, the enemy knows how long it took after the time Hanford and Oak Ridge were built, to drop the bombs. Using these data, he can make a minimum estimate of our present stockpile. Secondly, he was given the details of effects in Japan, and knows what the damage is. As to whether we shall or shall not use it, he knows there was some outcry in this country but not too much. He knows that if he strikes at us, we are going to use our full force. Mr. Stephan mentioned the possibility he may keep pushing at the fringes of our area to improve his position, but he knows if he goes any further, he'll get it. Thus we have an existing situation; we ought to be able to determine the psychological effect of our having the weapon - either in cold or in hot war. Why not determine the effects now? What should this do to our putting up with him elbowing his way up the fringes - knowing he cannot get at us directly?

Leitao: We have often discussed this problem, and I think the answer is so simple that I am almost embarrassed in stating it. It is simply that at any time since August 1945 we only had to state what the borderline is, what the keep-out area is, to have the Politburo keep out! The fact that this was regarded as a problem is entirely of our own doing - it does not correspond to the realities of the situation. The answer to Mr. Collbohm's question seems to be that it depends only upon a relatively unsophisticated utilization of our present position to make them keep out whenever we want them to keep out.

A second question is: how could we use this weapon to restrict the area of the world which is now, or is about to fall, under the control of the Politburo. How can we influence the Politburo? We have to specify what the target structure of the Politburo is: Without minimizing the strength of its position or falling victim to the democratic fallacy, we can still discover the enormous potentialities of the situation - the contrast between the world situation in which we allow ourselves to drift into something which will be a near-catastrophe later in the century, and the enormous potentialities for redressing the situation within a democratic framework. Thus far, there is no thorough study of the Politburo. I am engaged on a study which I think will be available in a year or so. Two points have already emerged in this study:

- (1) The Politburo is extremely stubborn, that is, it will not give in unless absolutely forced;
- (2) There is to my knowledge no elite, no ruling group in modern history which is potentially more yielding, if it can prove to itself that it is indispensable for self-preservation.

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Now the question is: could we not redress the world situation by the threat of the use - or non-use - of the atomic weapon?

Williams: If the atomic bomb is strong enough to hold them by a mere threat, but perhaps not to force them back, perhaps this suggests we should get a new, better weapon.

Leites: I also assume the atom bomb is strong enough to force them to retreat, by its mere existence.

Rostan: The Russians have never said to their own people that they have an effective defense against the atom bomb. They only suggested they will also have it.

Leites: They did say the atom bomb would not be so effective against them, but we may question their sincerity.

Rostan: It would be reasonably simple to make a quick analysis of the Russian reaction to the Forrestal announcement on the satellite. This would offer a clue as to how they appraise an announced weapon. We could also watch their reactions to further announcements.

Speier: Would it not be even more important to study the Russian reactions to the atom bomb?

Williams: I wonder if the official announcement of the Satellite was not the same kind of faux pas as the use of the atom bomb in World War II; the greatest psychological utility of any weapon, in peace or war, is mystery. If the secret is not disclosed, the enemy will assume we have something better. A few examples: the German V-1 and the Japanese balloons. The worst was not Hitler's boasting but that the discoveries made by our intelligence made us speculate about terrible potentialities of an unknown weapon. Actually, the payload of the V-1 was small, but we anticipated the worst and diverted part of our strategic airforce to bombing the launching sites instead of a more profitable use. So the mystery had a bigger effect than the weapon was worth. It was the same with the Japanese balloons. The payload was ridiculously small and we need not have worried but we did - maybe they carried anthrax germs or something like that. It turned out they did not - they were stupid enough to put incendiaries in them, but they had us worried. So I suggest the maximum effect is through leakages of incomplete information. Why not create mystery? We could classify 51 factories Top Secret. They would worry about them.

Ridencour: There's also another principle - they would not believe what they find out, even if it were accurate. In this case, you may have both disclosure and secrecy - have your facts and eat it.

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Goldsen: All this points to a possible research project. What would really convince the Politburo of the consequences of certain courses of action? As Mr. Collbohm suggested, the Russians probably do not under-estimate our production of atomic weapons. But let's consider this possibility: they accept our monopoly and are prepared to run the risk of the concentrated 2-day raids as described. Maybe even 50% of the urban population, half of the cities are destroyed, but they would count on their long-range capacity to recuperate, - maybe counting on our withdrawal to the isolationist position Mr. Ridencour described. Thus they might accept the atomic threat even if they are fully convinced of what we could do to them.

Another possibility is that they do not believe it is effective in this sense. Or maybe they do not believe that we would use the bomb. These are a series of calculations each of which could be followed up. We may start from any one of these possibilities and then ask what we can do to change their calculations. Mr. Williams has mentioned the possibility of combining deception and leakage, - giving them evidence which they will believe to the effect that the damages will in fact be higher than they are ready to accept. What we do not have at this moment is a series of analyses of what would really convince the Russians of the possibility that certain events will occur.

Spieier: Since we have reached the last stage of the discussion, it would be desirable if the following speakers concentrated on possible research projects, e.g., to find out more about what we have to know to be able to convince our enemy of what is going to happen, and the other subjects that were mentioned.

Brodie: I do have a project to suggest, although it may not be a tactful one, in view of the fact that we are employed by the armed services - - - -

Spieier: We are employed by The RAND Corporation.

Brodie: I wonder to what extent the propaganda of some of our own armed services in support of their own specific needs invalidated the impact which the atomic raids on Hiroshima and Nagasaki would have had otherwise. Possibly some statement by high-ranking officers interested in other weapons minimized the value of what we have, and blunted its effect on Russia. Could it be possible to find out such possible effects, and use this information for guidance about public statements made by military officials?

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Cooler: I have two points. First: if a weapon is really effective enough, then it may not be so important to rely on leakages (as suggested by Mr. Williams). They simply would make a guess corresponding to reality. If a weapon is not so effective, it might be worth while to have them guessing that it may be worse than it is; but then they would make every effort to get more intelligence. Second: Research would be needed on the question how we could communicate with the Politburo. For that, it would be important to know how the Politburo operates - this is an important problem in itself.

Spicer:

I agree, but I would go further than that. If we find out that we cannot communicate with the Politburo, should we not concentrate next on how to influence the Politburo?

Leites: On this subject of research on the Politburo: It has been implied in this discussion that it would be relevant to pay very close attention to published Soviet reactions to the atomic bomb. Of course it would be, but on the other hand nobody at present knows anything much on the relation between what is printed and what is said on the "inside". We know how great the discrepancy of public statements and inside calculations was in the case of the Nazis; in the Soviet case there may be less, but it is certain that there is this discrepancy. However, nobody knows the rules for translating public statements into really entertained beliefs, and frankly I don't know how this problem could be tackled.

Maybe the most promising procedure would be this: First, look at a Politburo doctrine which is very strongly held, and ask whether there may be a subdoctrine on how to behave under duress. Then we observe behavior under duress and may find that indeed it corresponds to the subdoctrine rather than to the principal official doctrine. In connection with what Mr. Goldsen said, I would suggest the following hypothesis:

(1) The Politburo does not believe that it can influence what we do - the "imperialists" are following their own scheme rigidly, whatever the Soviets do; *not*

(2) The Politburo believes that in so far as there exists any possibility to influence us, it can be done only by extreme rudeness and unpleasantness; *not*

(3) The Politburo is extremely scared of the 2-day raid possibility mentioned by Mr. Ridencour; *not*

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(4) If it should come, the Politburo would offer very serious concessions after the first 10 minutes.

Devison: It seems we have been talking about the possible effects of the atomic bomb without considering the possible effects of other weapons which might nullify the effects of the atomic weapon. For instance, the Soviets might think of using bacteriological weapons in retaliation, and they might think these are worse than the atom bomb. Therefore, it seems to me that one possible research project might be to attempt to rank the reactions to various types of weapons among various rulers and populations. It would be useful to know how the Russian rulers rank various weapons. As to communication with foreign governments: We could investigate the use we can make of our Civil defense measures for this purpose; such civil defense programs could be planned with an eye to their psychological effect abroad.

Hall: There seems to be some confusion as regards the psychological effects of our having the A-bomb. The Russians probably have an adequate idea of what the bomb can do and they respect its capabilities. The real difficulty stems from the subject Mr. Lesswell mentioned earlier - that is, our own objective. Our goal is a free world commonwealth; this may be quite vague, but it exists. However, this is what we could call a maximum goal. There is, in a hazy sense, also a minimum goal; self-preservation. We certainly would not tolerate anything that would interfere with this minimum goal; I think it would be good if the Russians knew that we would not tolerate any action beyond a certain point which would endanger our self-preservation.

Leites: Does the idea of the Asiatic continent endanger self-preservation?

Hall: I don't know. This is a very involved question; we have never had a coherent national policy with regard to these things - in general, we never declare war first.

Devson: I gather from what Mr. Hall says that there is a communications problem here - a problem of communicating with the U. S. policy makers.

Hall: There is an important problem which has not been mentioned so far; its solution would seem to be largely psychological. Mr. Ridgway has referred to cities and industry as if they were the same thing. In actual fact, we must distinguish between cities as population centers, and the centers of war industries (factories, oil industries, steel industry, etc.). The production centers are normally located

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at some distance from the population centers, and the distance is usually greater than the radius of destruction by the atom bomb. This raises the very important problem of the choice of targets. You may either attempt to destroy the population centers, inflict the maximum damage and kill the maximum number of people, or strike at the enemy's capabilities of producing instruments of war. Even in Hiroshima, which is a fairly compact city, the atomic bomb which wiped out the center caused relatively minor damage to the industries located at the periphery. We may not have to make this choice if we have a great many bombs, but it may be impossible for us to do both things, e.g. if our stockpile of bombs is small, or because we cannot do both in the first two days. Or we can make a deliberate choice in view of our own longrange objectives as outlined by Mr. Lasswell. There may be objections against doing one of these things.

As to the effects of these alternative courses, we can estimate the probable effects of the destruction of industries, but it is difficult to make any estimate of the effect of the destruction of population centers merely on the basis of the experiences gathered in the last war. For instance, the USSR survey has shown that the very massive bombing in the last war up to the end of 1943 was quite ineffective in reducing the volume of German war production. In fact, German war production rose steadily and rapidly throughout this period. On the other hand, the selective bombing of production centers from 1944 was very effective. Now if we take the atom bomb, its effects in this respect may be quite different - possibly because it is a far more lethal weapon, or because its effects would be compressed into a shorter period; it also might have a different effect because of its horror aspect. But in any case, there is a major project involved, namely, determining the relative effectiveness of the two target systems in psychological as well as economic terms.

Brodel: I should like to make a distinction between two problems that have been mentioned. One was Mr. Lasswell's point of convincing the Russians that we will in fact use the atomic bomb if they attack; the second is to convince them of its effectiveness if it is used. The public evidence of the effects achieved at Hiroshima and Nagasaki is only part of the task of convincing the Russians of the effectiveness of the atom bomb, and in all we said and did since then we went out of our way to convince them that the number we have is quite small. The 15 billion dollars we have been spending annually had a negative propaganda effect in this respect. If we have enough A-bombs, why spend so much on conventional weapons?

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In an article recently published in a Russian military journal, a Russian colonel summarized the most important lessons of the last war as

- (1) the importance of having accurate small arms fire, and
- (2) the importance of accustoming men to long forced marches.

Now everything we did in our recent military appropriations supports this kind of analysis.

To turn to another point: We do not know, and never tried to find out, how many bombs will do what. Research on this point requires many skills, economic and other; this information is needed to determine the most effective use of the weapon.

Jenks: I would like to suggest the following line of research: We need to know something about the threatmaker. Our fundamental problem is concerned with techniques to persuade the Politburo; this raises a host of questions concerning alternative techniques of persuasion and concerning existing predispositions. There will be no absolute blueprints on this; it will have to be played by ear to some extent, and the methods must be tried out over a period of time. We have to consider certain dangers threatening those who apply these persuasion techniques. In the light of what Mr. Lasswell said, it may turn out that the persuasion techniques we use will alter our own goal structures. Another possibility is that the threatmakers themselves will become less rational in their thinking. The question is how we can minimize the dangers threatening the threat-makers. Some experiments could be made, using comparable situations.

Finally, we must consider the reactions of our own public opinion to threats which are made public, and the influences of public opinion on the threat-makers at each successive step.

A further research possibility would concern the personality characteristics which have to be taken into account in selecting people who are to exercise policy functions and may become the objects of pressure by public opinion.

Beeler: I think this was a most welcome contribution for linking up our discussions of the A-bomb with the long-range model presented by Mr. Lasswell. Throughout the discussion, I have had the eerie feeling which some of the speakers expressed: that reality itself suggests a U. S. policy which the policy makers for some reason fail to realize. When we find ourselves in this position, we really

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begin to question our conscience, since it does not happen so frequently that one meets people who are so much dumber than oneself.

Selznick: Mr. Leites had suggested that the answer to this question is quite simple, but this is deceptive, since the U. S. policy makers are not free to apply this knowledge.

Leites: My definition of simplicity does not include that freedom.

Selznick: The answer is simple only if we don't understand this complicating factor. This suggests two or more problems. One is to convince the Russians that we are ready to go into this sort of thing, that we ... is freer than it really is - to convince not only the Russians but other Europeans as well. The second suggestion is perhaps more realistic - we might attempt to examine the range of freedom of our government, e.g. to someone in General Cley's position, and to explore the possibilities of maximizing that freedom. What would be the consequences of increasing the range of freedom? The capabilities of weapons can be discussed realistically only if we also try to ascertain the limits of the freedom of action open to U. S. decision-makers.

Leites: We have to make a distinction between these two questions:

(1) What are the probable consequences of a certain action?

(2) What are the chances that a certain action will be adopted?

Leaswell: As a supplement to what has been said, I would suggest that research along the following lines would be useful: What are the possibilities inherent in the use of the atomic bomb for the purpose of influencing developments within the Soviet sphere? I mean material use as well as use in communications. It would be worth while to investigate circumstances in which there has been an increase in decentralization within the Soviet sphere; for instance: reconstruction of Soviet cities. There is strong evidence for a high degree of decentralization in the plains of the reconstructed Soviet cities. An investigation of administrative practices from Moscow to the ~~more~~ regional capitals might locate instances of decentralization. I used not underline the importance of this.

Secondly: democratization. There are situations in the Soviet Union in which there has been an increase in freedom.

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For example, there has been an augmentation in the number of consultations with workers in factories, following a period in which there was no consultation. I propose studies of this type to determine the impact of communications about the A-bomb upon developments within the Soviet Union, as well as the probable impact of the bomb itself. Such an inquiry would be relevant to the question asked by Mr. Speier: How do we change the Politburo - through decentralization, democratization, demilitarization? These processes may render obsolescent and formalistic the (Soviet) expectations of the "inevitability" of certain events.

Goldhauer: There has been one limitation in this discussion - one question has been by-passed. We were talking about convincing the Politburo about what would happen, for the purpose of getting them to retreat a little - but nothing was said about the terms of the retreat. Do we want them to get out of Romania or Bulgaria? Then we may do so, but impose no retreat term such as the demobilization of scientific laboratories. Then research will go on and we suddenly find ourselves beyond stages (2) or (3) mentioned by Mr. Brodsky, which have been assumed throughout this discussion, and may reach stage (4) in which the Politburo in its turn may try to convince us. That would seem to suggest that in thinking of research objectives, we should not merely think of how to convince them, but also of how to suggest lines of activity which would precisely clarify the problem. Maybe it is not only a matter of convincing the Politburo but - to return to Mr. Speier's suggestion - of changing it, bringing about internal changes so that when stage (4) comes we do not start all over again.

Poston: Apparently there is still enormous interest in this problem of communication with the Politburo, which indicates a high degree of realism; and there were indications of our failure to use the existing methods of communication. It would be a useful project if someone tried to work out the most successful ways of communicating with paranoid personalities. We are not being facetious. There is a parallel between paranoid and certain political assumptions about a certain type of people and where we cannot find what the Soviet leadership say around the conference table, it might be wise to apply the mechanisms created in the literature of paranoid. How do you change the paranoid's picture of the surrounding universe?

Lawson: This might also be useful as regards some people in the U. S. - the category of paranoid is far more inclusive.

Speier: I shall not give a summary of this discussion; a summary will be prepared later. Some points which were barely touched upon deserve being treated at great length later. I

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certainly would like to come back to the points raised by
Messrs. Goldammer and Hitch.

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Speaker: I thought it would be a good idea to take stock of what we covered in our last session yesterday. Since I did not give a summary at the end of the discussion, I shall try now to mention at least some of the highlights.

The discussion started with Mr. Lasswell's presentation of a model of values and a developmental construct which I am sure is still vivid in your minds. Then Mr. Ridgway introduced the discussion of the A-bomb by describing its destructiveness; he made the point that it would be possible to equal in two days the amount of destruction caused in Japan during the entire course of World War II. After this, Mr. Brode outlined four stages in atomic weapon development, beginning with U.S. monopoly and a small stockpile, going on to U.S. monopoly with a large stockpile of bombs, the loss of monopoly with marked superiority -- which, it was suggested, might be a more favorable situation than stage 1 --, and finally, the loss of monopoly without superiority.

In discussing the situation in the framework set by these presentations, we reached, if I am not mistaken, the conclusion that in view of these realities, U.S. policy must almost be described as inadequate, or at least very poor. We to not utilize all our potentialities -- our power position could be more effectively asserted if all these factors were taken into account. This did not seem in our discussion that we should start bombing Russia now; the problem appeared as one of communication with the Soviet Union, since the Politburo seems to have a different estimate of the situation. Our discussion concentrated almost exclusively on this problem of convincing the Politburo, without taking into account other possibilities of redressing the situation ~~in~~ ^{after} of war. There is also the theoretical possibility of changing or replacing the Soviet ruling group by appropriate means which we might discuss.

If our estimate is correct, it would definitely be worthwhile to consider unconventional means by which a change could be effected. However, this may not be a proper subject for this conference to consider. I only want to mention that it might be better to spend 2 billion dollars on this than to spend 15 billion annually on armaments. Suggestions along these lines may be fantastic and I need not pursue this point any further.

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I merely wanted to indicate that the problem of "communication" does not exhaust the matter.

Another possibility, which may also be dismissed as impracticable, would consist in changing the behavior of the Soviet rulers by generating enough pressure on the parts of the Russian masses. This is a longue proposition in view of the totalitarian character of the Soviet regime. In a way, this may lend itself to the kind of program the Voice of America has--telling the Soviet people about the values we are striving for, our desire of peace, and making them why they do not relent. But the question is who should accede to those suggestions? It is not easy to see how this would be followed up, but the approach may be tried.

There is also the problem of subversion which has not yet been explored. The question is whether such a result would be desirable, feasible, and what would be its price.

However, the most important point I wanted to come to in this meeting was the basic feeling I mentioned yesterday: if we are right in our estimate of the situation, why does our government not act accordingly? It is then difficult to understand the permissive policy towards the Soviet Union which has enabled them recently to win World War III in China, --or possibly so. This raises the question whether communication with our policy-making crowd is not in itself a very important problem.

Finally, there is the following possibility of reducing the gap between reality and policy: instead of trying to change the thinking of the Politburo, instead of subverting the Soviet masses, instead of changing U. S. attitudes, we might concentrate upon changing the general situation in the in-between areas. In a sense it might be said that the Marshall plan is such an attempt at exerting a few influences in order to create a change in thinking. To attempt such a change the world environment in this direction is the values outlined by Mr. Lasswell.

If we have a hypothesis in mind, we may distinguish the following areas:



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We have made some

- (1) communications between U. S. and S. U.;
- (2) changing the Soviet ruling group;
- (3) communicating with the U. S. decision-makers;
- (4) subversion within the S. U.;
- (5) changes in the world environment.

No allusion was made in our discussion to problems (4) and (5). There are also other possibilities, but I wanted to give you this as a frame of reference.

All our discussions I entered haphazardly on what I may call a pre-war situation; we did not talk much about using the A-bomb in a war situation, or the alternative uses on which we may decide. Mr. Hitch, for instance, emphasized the importance of the choices of target systems--the alternative use of the A-bomb against population centers or production centers. Could social scientists give any advice on the relative utility of these uses?

When Mr. Foster spoke about the different effects of bombing vs killing, it was pointed out that experience gathered so far may not be sufficient to determine the psychological effects of very concentrated bombing. Killing a very large number of people, especially if the actions are concentrated within two days, Mr. Goldmann referred to this when he spoke about "killing" yesterday morning. But I don't know whether any social scientist can make any valid estimate as to whether it is preferable to bomb production centers or population centers. Evidence from the last war, as Mr. Hitch pointed out, seems to indicate that bombing of population centers was less effective in reducing resistance than bombing of industrial sites. But on the other hand, a very heavy concentration of attack would have such a shock effect that the evidence from the last war would be largely irrelevant.

Another question for: What to launch a two-day bombing attack on
such tremendous magnitude, who would be the participants on
the side which bombing would cause a feeling of horror and
anguish of which the inhabitants had spoken. Thus psycho-
logical aspect: how can it be clarified in deciding about the use
of the weapon.

Finally, the long-range effects of bombing of this type may be such as to render it undesirable. By long-range effects, I mean not only long-range economic but also moral effects which we don't want to risk. For instance, our conclusion might be that our beliefs in values (as presented by Mr. Maxwell) will be so thoroughly shaken that they cannot recover. Economically,

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It may not be the end of the world, but morally it could be. We need not exclude such considerations, although they need not be taken up this morning. If you want to comment along these lines, you should of course feel free to do so at any moment.

To come back to Mr. Hitch's problem, my first question would be: Can social scientists say something about the best choice of a target system? Perhaps we would state the conditions under which we could answer such a question and then conclude that these conditions are not given. The Air Force, of course, is vitally interested in this question, and some research is being done.

To make a last point: Mr. Goldhamer made an important remark in the last session which was left aside in favor of the political problem raised by Mr. Collbohm--the "pre-war" political situation in which "communication with the Politburo" is of primary importance. Mr. Goldhamer's remark concerned, if I understood him correctly, the war situation, namely: After war breaks out, the problem of convincing the Politburo takes on a different character; we may use warning raids for this purpose. This, then, points to the examination of the instalment use of the atom bomb as distinct from its all-out use. We might well take up this question in this morning's session, and, if this is agreeable to you, consider the discussion about political communication with the Politburo as closed. My suggestion is that we turn to the war situation and discuss specific problems, especially those raised by Messrs. Hitch and Goldhamer. In addition, I would like to ask Mr. Janis to say something about the psychological effects of atom bombing in the last war which he has studied in great detail. Is there any comment on these suggestions?

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TARGET SYSTEMS AND ESTIMATING PSYCHOLOGICAL EFFECTS

Paxson: It seems important to discuss the choice of target system on a symmetrical basis, and also consider what targets the Soviets would select in the United States. It seems to me that in these discussions we often assume that the United States has complete control of the situation. Would this make the discussion easier?

Spoiler: I think it would make it harder especially when you speak about psychological effects.

Stephan: It may be harder to deal with these effects in terms of a symmetrical situation, but on the other hand it also seems that you cannot get valid answers unless you proceed in this way. You purchase simplicity at the price of being as unrealistic that the answers are of no use. Furthermore, it is not only a question of each bombing the other, but the psychological situation is different depending on what had gone before. The psychological reaction of either side is a function of what preceded the situation, and the minimum simplification compatible with realism is one in which you assume that a) an and such thing had happened on either side--what are the effects then if we do a. b. c or d.

Paxson: The morale effect (upon us) of using the atom bomb is found to be different if we have been bombed previously. 7

Soalo: As to this question of symmetry, it seems good to bear in mind Mr. Brodie's fourfold distinction which shows that the situation may or may not be symmetrical in several ways.

Spoiler: Mr. Paxson, I think, did not mean to imply by "symmetrical discussion" that the situation is claimed as regards the A-bomb but merely that both sides have weapons which will be used against the other. It is not implied that the damage will be equal.

Stephan: In your review of yesterday's session, you made it clear that we discussed the political situation, certain aspects of psychological warfare, problems of communication and secrecy, and also the psychological effects of the unconventional weapons which are officially the tools of the conference. Now I would like to know what is the consensus among the members of this conference. Are we to concern ourselves with overall political questions and pre-war as well as war situations, or with the specific psychological effects of unconventional

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weapons? It would be fruitless if our discussions were chiefly methodological.

Spiegel: Yes, but yesterday's discussion cannot be characterized as a methodological one; nor did I propose such a discussion. You cannot discuss methods fruitfully without discussing problems. What I suggested was merely that we take off the shelves two important problems which were raised and then shelved yesterday. Then we can proceed to other things, and Mr. Janis' presentation will certainly bring up the specific psychological effects of A-weapons. Then we may take up the question of the denial of areas, and of the saturation.

The latter point will be taken up in an informal meeting at 3 p.m. As to the question of the choice of targets, you may dismiss it, but I personally would like to return to it. The question is this: can social scientists answer the question whether it is preferable to bomb population centers rather than industrial targets? We can either attack the physical capacity to resist or the will to resist among masses or leaders. Bombing population centers would primarily aim at the masses; bombing of industrial targets would be directed against physical capacities. As I tried to define the problem, the main objective would seem to be to minimize effective resistance without maximizing destruction. The answer might be in these terms that it would be best to use all A-bombs for two days on population centers without attacking oil targets or not to bomb any cities but only to bomb the army areas or not to bomb either the cities or the army but only oil targets. I don't know what the answer is; you may be able to supply this.

Stephan: I would venture the conjecture that the problem has no answer; in other words that it is indeterminate, since we have not specified our values and objectives. Until we do that, and until we know more about the technical possibilities of success of each type of action, its degree of success (where success is a matter of degree), its costs, and the effects upon ourselves, we cannot answer the question. Evidence from the war shows this. For instance, a simple case: if an army is engaged in fighting an enemy back in the field. Then the question arises whether we should bomb a bridge behind the enemy lines. If we did, this would distract the enemy's movements, but we might need the bridge later on. Against this, you have the possibility that the enemy may destroy the bridge in the process of retreat. We cannot answer the question unless without going through all alternatives in such an analytic

Janis: I agree in principle with what Mr. Stephan said, but I think a strong case could be made that one could give a rather unambiguous answer under certain circumstances. For

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instance, if in case of war with the Soviet Union we do not want unconditional surrender, but their acceptance of certain terms (which merely diminish their position in the world, and possibly set off certain disintegration processes in the capital), then there is a good case for concentrating upon industries rather than population centers. Then I would add the following point to what Mr. Speier had said: Those who are familiar with the Soviet elite know that they put a very high emotional charge upon any destruction of industrial facilities, whereas their emotional involvement in the loss of human beings is low, which is connected with their profound belief in the human regeneration capacity of the Soviet Union, not only demographically but also with regard to semi-skilled or skilled personnel. Without such belief, the extent of the purges of 1930-38 would be incomprehensible. This factor would favor concentration upon industrial objectives if we want to coincide in acceptance of terms better than unconditional surrender.

Speaker: Would you not think that in the United States, the relative rank order of the value of life vs industrial facilities is reversed?

Author: Of course.) - not !

Author: On the other hand, we have to consider that the A-bomb is potentially far more destructive in terms of human life than in terms of industrial facilities.

Speaker: I think this is precisely the problem. Can you say to the indifference toward the Poliakov regarding different specific patterns of damage? It is conceivable that "personal" would put a higher rank order than industrial facilities if the number of deaths killed is large enough, and if social segments of the population were under shock. The Poliakovs may face the losses with highly if not more hostile and communist parties and classes as indiscriminately to be killed.

Author: But we also protection should not be neglected from the point of view of the types of the losses in the militarily area.

Speaker: I agree with what Mr. Speier said: the facts according to his opinion are not available. However, we do not have ultimate objectives. We have to be flexible with other objectives. We have to handle the problem of invisibility. The irreducible number of survivors, the amount of indiscriminate destruction, but we don't know how to evaluate the psychological effects of

attacks upon various target systems. What we really want to know is how we could go about getting at least a plausible answer about psychological effects.

Coale: The problem is different from what it was in the last war, because of the different time scale: In Hamburg, for instance, the destruction caused did not seriously interfere with industrial production at the periphery, because it was possible to rush aid to the area from un-bombed centers. The effect would have been entirely different had all these centers been bombed at the same time; if the casualty rate had been increased fifteenfold (which is the case if A-bombs are used) in all these centers, industrial production might have been cut down to zero.

On the question of minimizing effective resistance without maximizing damage: if we do not want to destroy all cities civilianically but select a limited objective, I wonder whether knowledge of the structure of the Soviet government, plus the knowledge of the selectivity of the A-bomb, would not lead to the decision to bomb Moscow. Since the members of the elite are concentrated in Moscow, they might be wiped out completely.

Macmillan: But the elite would probably not stay in Moscow.

Coale: Could we not assume that there are the two following possibilities: either we decide to do this as a super-attack against all major industrial centers, in which case Mr. Coale's suggestion is very important, or there would be a previous psychological bombing, the probability of which is about 75% English, well in this case, as Mr. Coale suggested--

Macmillan: That depends on how smart they are.

Coale: They are very smart in this respect, we can be sure of that. If they are determined, they will carry out.

Macmillan: I would like to add something to what Mr. Coale said. I think it is true that the Russians have a super-attack plan, but it is not the peripheral plan that they have. It is the total attack as they had it in the first war. Now if they applied that kind of attack, probably in a war in which current production is disrupted, it will be even easier for them in a war which will be fought on destroyable. In this case, the present imports, imports, would be gone in the horses heads, and the horses heads in the course of the field forces. So it is very difficult to find possible effects which would weaken it. If destruction of the physical plant left both the population and the stockpiles intact, I wonder whether it would be preferable to concentrate on that.

* Concentration of deer on some other idea.

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Williams: In connection with the possible concentration in time of the A-bomb attacks: Mr. Ridenour said that the whole destruction caused by the 20th air force in Japan could have been achieved in two days if A-bombs had been used. Now would it be possible to make a simple calculation, e.g., that the same destruction could be achieved in one day if one used twice as large a force?

Rosten: I think it is important to introduce the following supplementary factor: Whatever targets are chosen, the attack must be accompanied by an explanation, directed to the Japanese, as well as the masses, of why they have been chosen. We cannot defer the explanation until after the end of the hostilities. Then the explanation will sound like the rationalization of an act of expedient. Then as Mr. Goldhamer suggested, we cannot assume that anything we do will have the desired psychological effect, unless we ourselves know what we are doing. We wish a picture of the consequences we are able to control. The ability of any target system ultimately depends upon whether we succeed in imposing our interpretation of the attacks.

Rosen: In studying the psychological vs the material effects of the A-bomb, we should not forget the influence that the number of available A-bombs has upon their use. As in the case of every weapon, the number available profoundly affects the way to weigh A-bombs may be used--what sacrifice one is willing to make, what targets can be selected, etc. Mr. Ridenour's presentation was, it seems to me, predicated upon that we had targets available in large numbers, although I think no one is in a position to say what those numbers are. As I said before, without any calculations about figures, we can only make the assumption that the number will be sufficient. In an interview given by Admiral Nimitz when he was asked regarding with the right approach to the problem, he made the simple contention of the A-bomb is that it does not.

For studying psychological effects, smaller numbers may be more significant than larger ones. A specific number, such as 10, may be more effective psychologically than 4. Very small numbers would be of the greatest utility, if we could do it. Psychological effects of using a number which practically approach zero are highly realistic--near the maximum--such as 1. It will not occur.

I see Mr. Leitton agrees with this, and he also thinks that the more targets we use as well as the more targets we use the more psychological effect we will have.

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Seeger: Would you not agree that the threat would be more effective if the target population believed that we have more bombs?

Brodie: The effect would depend on how we ordered the attack; for instance, if we dropped two daily for a period of two weeks, they would not know how long we would continue. Incidentally, I used the figure 50 because it is known that we have already detonated 8; it might be assumed that we did not use more than one half of our stockpile. That would give us a total of sixteen after two or three years of production. For psychological effects, I would suggest studying such a number as 25.

Spaier: Did you not suggest that the psychological effect would be greater if the small number of bombs were spaced?

Goodie: I would not make such a postulate.

With a smaller capacity or smaller stockpile, we would be impelled to pay greater attention to manipulating the use of that small number to produce the greatest ramifications of effects; whereas if you feel you can be spanthrifths, you may neglect the psychological effects and just concentrate on clobbering the highlights out of the enemy. For training purposes we may increase a stockpile of 25 and see how that could be used to achieve the greatest effect upon both the capacity and the will to fight.

Frankenstein: I wanted to call attention to all the words "will to
POWER" and "capacity to resist." I believe that we are inter-
connected, since nobody can have the will to resist without
susceptibility. The ultimate decision concerns the question whether
we go on with the war or endow peace, and it is the function of
which has to make this decision. Which selection of terms
will have the greatest influence upon this decision? To know
now, little about the factors involved, but it seems that in
the minds of totalitarian rulers as well as of the majority,
susceptibilities are probably paramount. The rulers would probably
consider people as well as facilities primarily as factors of
their war potential and worry less about spiritual and moral values
of his people if the reward to fight is large. In this case
they could assume that were the resistance even in case of
grave disturbances, particularly because partly at the time
would always prefer to play a normal role in society, i.e., go
on producing. Hence the rulers would consider those who are will-
ing automatically available for war, and obviously they would
use the same arguments with regard to a socialist revolution.

320-507 You restate that we have previously called the "technocratic fallacy." The belief that the government's "will to exist" depends on the masses' spontaneous "decisions to fight."

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Kecskemeti: I did not want to imply that this spontaneous desire is the decisive factor, on the contrary--

Speier: Yes, that's what I mean. You rejected the "fallacy," that was clear. I only wanted to call your attention to what Mr. Coale said, that mass destruction on a very large scale may have an effect upon the capacity to resist, not only on the will to resist.

Leites: The discussion produced an impressive merging of what was previously known as the "Hitch problem," the "Goldhauer problem," and now the "Brodie problem." We are really talking about three possible war aims:

- (1) obliteration of the enemy: a very costly way of doing things, particularly costly for us in terms of its repercussions, and would be suicidal.
- (2) unconditional surrender.
- (3) a substantial retreat of the Politburo in territorial or other terms, with the two-fold aim of (a) weakening its threat to the world and (b) starting a process of disintegration after retreat.

Now I would propose, without citing any direct evidence, the hypothesis that the Politburo's reaction to unconditional surrender and to limited terms is sharply polarized. As regards a stand of unconditional surrender, they would be tougher than the Nazis, whereas they would relatively easily accept limited terms. If we were to propose unconditional surrender, I would agree with Mr. Goldhauer that it is impossible to convince them, but not if we propose limited terms.

Now there are two possibilities as to how to bring this about-- by a concentrated "two-day" bombing campaign or by a spread-out "three-week" campaign. It would be extremely important to study the implications of both. I would regard as more effective a concentrated attack of two hours, accompanied by a statement that we are willing to desist at any moment if you accept our terms.

I would like to add a few words about a problem which has been touched upon--the relation between the losses inflicted upon the Soviet mass, and the resistance of the Soviet mass to the Soviet rulers. I would submit that there is probably no direct relationship of the sort--that resistance grows as losses mount, but there may be indirect gains of actual losses and particularly threats of losses which maximize hostility to the rulers. After a bombing of two hours, there may be excellent opportunity of achieving the greatest possible effect in this direction.

Pidansuri: As to the suggestion that the effect of the A-bomb

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open ourselves is at least as important as its effect upon Russia, I would suggest that if the hypothesis I was making yesterday about the success of the initial attack, we run no risk by making preliminary announcements. In this fashion, we can have the maximum effect upon the Russians and the most favorable impact upon us, because what this amounts to is that we say THIS IS A REASONABLE, that we do not want to kill people but tell them they can leave the cities and stay alive. Americans would consider this as a reasonable use of a dreadful weapon.

Qeldsen: Only if they cannot retaliate in the same fashion.

Ridgeway: It does not seem that you must make that assumption.

Boston: If you give them time to get out, you give them an opportunity to mount a counteroffensive. And that raises the very serious question whether our traditional policy of waiting until we are attacked is still practicable. We saw what happened at Pearl Harbor because we said we could not take the

Donals: Mr. Leites said that Soviet attitudes towards "unconditional surrender" and "limited terms" are polarized. I suspect the American reaction to those alternatives would also be polarized. I wonder, if we were to go to war with Russia, whether the native would not tend to be to rip out this whole segment. Here you have bi-polarity in the reverse--I wonder whether you could not succeed in eradicating this native if you tried to move to this as a long term objective.

McGOWAN: I am somewhat puzzled by the suggestion that we launch an all-out attack and then announce that we'll pull it off if they accept terms within five hours. The question is how the public could be informed about the situation and act on it before five hours.

The general point is to time things so as to give Max opportunity as not as fast as their installations will permit. This is true in both cases mentioned.

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USES AND EFFECTS OF THE ATOMIC BOMB

Junis: To start with, I would take up one of the central problems involved under the general heading: How to minimize resistance without maximizing deprivations. Certainly one of the central questions if we assume a war situation is how to motivate acceptance of our policy goals. Some obvious possibilities along these lines are: creating panic, producing unauthorized frustration, producing an anxiety level so high that it interferes with job performances, and finally, rebellion and subversion.

Now, what can we learn from the use of the A-bomb in Japan concerning this particular problem? Well, not much; there was no public image of the bomb in Japan at the time it went off, no context for evaluating it. The picture we get from eyewitness accounts in the USSES material is that most people who went through the raid thought it was just another air raid; at most there was a certain amount of surprise at the extent of the damage. People had certain theories, e.g., that gasoline was dropped and ignited.

However, the direct physical impact of the bomb provoked panic and terror reactions. The demonstration effect (upon people not directly exposed) was slight. Information spread only by word of mouth and most people beyond a 40-mile radius knew nothing about the A-bomb raids. The ruling circles found out something about it, but it had little effect in motivating them to end the war, because they had made up their minds before the bomb was used.

On the other hand, we did learn from the Japanese experience something about the bomb and its impact. One way of putting it is that the A-bomb is in reality many different weapons. I shall enumerate these different weapon characteristics.

- (1) Sudden annihilation; this occurred in the center of impact, in an area with a diameter of about one mile.
- (2) In the periphery, many casualties occurred, including (a) burns, many of them of a hideous nature, (b) decompression effects, especially cuts caused by flying glass--this is basically a small missile effect, (c) radionuclide sickness--with several component effects, including lingering death--a severe illness from which people may recover but which is terrible in itself; sterility, the occurrence of which is in dispute, but we know that many miscarriages occurred; effect on genes with the possible production of monsters--but on this also there is no definite evidence; finally the psychological effect of not knowing whether one has been exposed and will develop radiation sickness.

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- (3) Physical damage: conflagrations, destruction of buildings, producing panic effects and other psychological effects resulting from the destruction of objects having sentimental value, such as homes, local landmarks.
- (4) The denial effect: the A-bomb may have the effect of driving people away from a certain contaminated area for a long period of time. Spraying a city with radioactive dusts can produce such an effect.
- (5) Another possible use of the A-bomb would consist in producing a ground shake by exploding it below the ground; this would result in the traumatic effect of an earthquake.
- (6) We have to consider the psychological effect of the loss of loved ones.
- (7) An important effect is the disruption of sanitation; this can lead to epidemics and other effects.

When we consider these various impacts of the bomb, we are evaluating its possible use for purposes of psychological warfare. What can we demonstrate about the bomb to motivate compliance with our policies? What actual use of the bomb has the greatest psychological effect? Shall it be used as an earthquake weapon, as a radiation sickness weapon, or for any one of the other purposes listed above? Still more important, is seems to me, is the symbolic threat created by the bomb. When we want to give a demonstration, the question is what shall be communicated to people who have not been exposed to an actual raid. In our psychological warfare problems is which of these threats are apt to produce a boomerang effect. For instance, if we emphasize certain features such as sudden death, the result may be that people completely lose their anxieties about the bomb (fatalism, apathy). If such casualties as burns and consciousness effects are emphasized, this will place the A-bomb in the same category as earlier air raids, so that people would say "We have already gone through all that,"; at most it will motivate them to activate anti-raid precautions. Radiation sickness might be the most critical factor. This remains to be seen. It may be assumed that in one United States, radiation sickness is the primary anxiety-producing factor, but it may well be something else. It would be well to know all about these possibilities.

The general problem for research is to focus on the results in what way to each of these threats. We can consider threats either in connection with a demonstration where the bomb is actually used, or in connection with a pre-war situation in which we want to convince the enemy that they face the alternative of cooperating or being destroyed.

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What matters however, is in what terms this possibility of "destruction" is to be presented. And here we face the problem of how to gather relevant information. I am sure it has occurred to many of us that some threats would give rise to relatively little variation in reactions. If, for instance, a man were confronted with the danger of sudden death, his reaction might be less dependent on previous experience and predispositions than if he is threatened with burns. We might possibly find many common responses among people with different predispositions. For instance, many people in this country would probably react to the threat of sudden death in the way I indicated - by putting it aside, refusing to react to it. If we found that this is the case, we might infer that a similar reaction could occur among people with different predispositions. This is one possibility of finding invariant responses.

It is more important, from the standpoint of influencing an enemy nation, to find out something about how the government and the mass of the population would react. We might study this on the basis of what we know about the personality structure of the enemy; it might be possible to select subjects who have a similar personality structure and to investigate their reactions to various types of threats. This procedure has many obvious defects but it still represents a potential source of information about the possible consequences of using various forms of threats.

More all, you have to remember that one of our problems is how various threats affect our own population. If in any situation we make threats, not the enemy is made not just to the enemy but also to our own people. This is especially true in a cold war situation in which the enemy also wants information, motives and opportunities publicly - the situation which was mentioned earlier. Then any threat we make elicited an expectation of possible retaliation and we have all the negative effects again as would be intended to produce among the enemy. In sum, we want to have the fullest knowledge possible concerning the reactions to different threats among different classes of the population. Max

To make one more general point: I think our study of unconventional weapons should begin with the various physical effects of various alternative uses. From there we can go on to examine the psychological effects extending upon these various impacts. I suggest that it would be worthwhile to consider each of these in turn and to establish the influence of each of these weapons upon the enemy's will to resist.

Society: Are there any comments or general questions before a detailed discussion point by point? I'm sorry you didn't comment on the alternative between "destruction" and "minim of losses".

Janis: I should say this also represents an alternative use of the bomb. I suppose the bomb could be used so as to maximize destruction in a concentrated area - or to produce sporadic destruction of life throughout a larger area, resulting in more survivors but also more losses of individual family members as against entire families.

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Swisher: I mentioned this, because one point on our agenda is the discussion of area denial - the A-weapon could be used so as to deny access to areas.

Goals: I want to return to the point made that knowledge of the raid was limited to a small area in Japan. In this respect there might be a very pronounced difference between the U.S. and the Soviet Union. I can't conceive of an A-bomb being dropped anywhere in this country - even on an insignificant village - without the fact being immediately known throughout the country. It might very well be that either as a matter of policy or because of more primitive communications, the situation in the Soviet Union might be more similar to the one in Japan.

USSR
Swisher

A possible tactical use of the A-bomb threat would be this: if it is generally known what a single bomb can do, we can send dry-run raiders over cities; the approach of a single plane then might create a major panic (even if no bomb is dropped); the disruption effect might be the same as that of a thousand-plane raid.

A question to Mr. Sidemour: Would a subterranean explosion produce radioactive dust, similar to the radioactive by-products of an under-water explosion?

Sidemour: I can only make a guess about it. My guess would be that the effect would be smaller than in the case of the under-water explosion, partly because the dust would drift away and partly because radioactive particles would stay in the ground.

Swisher: Would it enlarge the area of discussion too much to ask about possible effects of the combined use of atomic, bacteriological and radiological weapons?

Jacobs: From the psychological point of view, the effect of radiological weapons would be similar to the radiation sickness effect of the atom bomb. I would, however, suggest leaving RW out of the discussion at least temporarily, because we have enough variables to deal with. In the case of SW, too, each alternative effect would have to be considered separately.

Swisher: Is it not possible that one A-bomb plus radioactive dusting would be worth more than several A-bombs, because it would interfere with various activities?

Jacobs: That is a possibility, but the first question before determining practical uses would be how to get sufficient knowledge about psychological effects.

Sidemour: There is one point in connection with this, that if the anti-aircraft facilities in a city are disrupted by an A-bomb attack, that city becomes far more vulnerable to SW attacks. That may be another point to consider.

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Hostess: Mr. Janis has indicated that the use of the bomb in Hiroshima and Nagasaki was a specific instance because no previous information was given. What do you think the effect would have been if there had been an explanation beforehand? Would the reactions have been different if the use of the bomb had been preceded by a PW action? Do you think there would have been a greater awareness of radiation possibilities, resulting in a greater psychological impact?

Janis: From the material we have it appears that there was no anxiety about radiation sickness until the first symptoms developed. After that, people thought it was a mysterious malady and were surprised by the high death rate. Anxiety would have been much greater if people had known about that effect beforehand. Those who have had information about what happened at Hiroshima and Nagasaki became very jittery, but this was restricted to a forty-mile area around the stricken cities. If the whole Japanese people had known, the effect would have been quite different, even if the Japanese government at first had tried to minimize the information.

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ATOMIC WARFARE, PSYCHOLOGICALLY WAGED

Roesten: The suggestion you make in your memo concerning the possibility of channelling hostilities among the target population raises this question: If a bomb is dropped after prior warning, does this not make it possible to direct the hostility of the people against the government? This might be important in the Russian case, because this might be one of the ways in which mass reactions against the ruling group could be intensified - we could tell them that it is their own ruling group which is to blame if they are subjected to attack, and that they could gain safety by heeding the warning.

Leites: If at the same time we announce peace terms which are moderate, I think the effect of this would be especially great.

Roesten: This is a fruitful area for research, especially concerning the possibility of focusing blame for deprivations on a third person. In traditional diplomatic and military behavior, peace terms have not been unannounced until they were no longer effective. If the war is permitted to go on without any awareness on the enemy's part as to what we want from them, they will go on fighting under any circumstances because we give them no choice. It would be better to state the choice at the outset.

Sunier: This is an important point in connection with the psychological handling of the A-bomb. During the last war such attempts to saddle the enemy leaders with responsibility for the endured deprivations were of course made - not in the particular case of the A-bomb, but in general when we were talking to the Germans. We told them they had instigated only because of the Nazi Government. So we have to distinguish: (1) the question of prior warning; (2) convincing the enemy that their deprivations only because of the breakdown of negotiations with their ruling group about avoiding this damage. This is where specificity is of the greatest importance, because if you merely talk in general terms, your message will be taken only as the usual war propagandizing; you have to speak about specific negotiations which have failed due to the enemy rulers' disregard for the lives of their own people.

Roesten: You have mentioned the Germans in this connection, but I think their case was different because we previously had unannounced unconditional surrender as our aim, so that they had no real choice. The Nazis exploited this by saying that by surrendering they would face the equivalent of annihilation.

Sunier: Towards the end of the war, we told them they had to choose between the "peace party" and the "party of annihilation", but in general, I agree with you. The third point I wanted to mention was are there any unconventional diplomatic weapons that can be used in this context?

Williams: Could we clear up at this point that question about producing a ground shake or radioactive dust?

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Griggs: I would suggest that these points be taken off the list; the under-water blasts produced at Bikini cannot be compared to a real earthquake. The ground shake produced in the San Francisco earthquake was about 10^5 times stronger than the Bikini blast. It probably would be necessary to get very deeply into the ground (about 1 mile) to produce a comparable earthquake. On the other hand, in order to produce radioactive dust, the explosion must occur near the surface.

Sammelson: Would it be possible to precipitate a natural earthquake by using the A-bomb?

Griggs: In other words, you suggest to use the A-bomb explosion as a trigger. But the probability that you encounter a stress situation at your target is very small. And even if it were there, the effect still could not be compared with that of the San Francisco earthquake.

Further, I think you must also eliminate the "denial" effect of the A-bomb, because an airburst has no denial effect. The waterburst is a different matter, and it can have such an effect. But the question is, if we want to deny the use of an arms to the enemy, is the A-bomb the most suitable means to do it?

Sammelson: Would it be possible to detonate the bomb at a great enough altitude to have only one effect - say, the flying glass effect?

Griggs: Well, there is an optimum altitude for the flying glass which is not the same as the optimum for burns.

Stanton: How about radiation?

Griggs: As for radiation, you can't get any lingering radiation unless the explosion occurs below the surface. But you cannot separate all these effects, because the radius for sudden death is about the same as that for radiation effects; this is because the absorption of radiation is very high. The attenuation of the effect goes up exponentially as you move away from the center.

Brodie: May I suggest then that we eliminate from our list of effects ground shake and radiation from the bomb? We may take up the psychological effects of the other uses of the bomb point by point.

Stanton: Could we group all these effects together which are of a similar nature, such as burns via radiation sickness - since all these come under anti-personal effects?

Griggs: All the effects I have enumerated are anti-personal effects.

Stanton: But we may discuss immediate and long-range effects separately. We may take up the immediate effects first and then examine the long range effects.

Brodie: The loss of family members was listed as a separate dimension; but is it really separate? Is it not the same effect as the various calamities which the bomb may cause?

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Janis: I had intended to present all points in terms of their psychological effects upon the population. The question is what threat coming from the same objective event we want to consider -- the threat of personal elimination, that of the burning city, that of lingering sickness, that of the loss of loved ones, and so on. My major purpose was to inquire into the demonstration effect upon those who have not been exposed.

Leviton: Not also the psychological effect of actual use?

Janis: I had only the threat effects in mind.

Seeford: Could you not take up both effects in succession?

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Jenkin: On the second point, actual experience could intensify anxiety about the danger of subsequent exposures. In our case, this is likelier than adaptation to the danger situation which also occurs in other contexts. Fuller information on this could be gained from the study of peacetime disasters; the psychological effects of a burn are in some respects similar whether caused by an A-bomb or another cause. The traumatic effect of a peacetime disaster could also be similar. We cannot be sure about this, but all information we can get about reaction to disaster would be useful - e.g., concerning the loss of loved persons. If recurrent floods take place in an area, that would approximate certain wartime situations.

Speier: Do you think this is true regardless of the cause of the disaster?

Jenkin: No, the knowledge that it is an enemy who is causing the danger introduces a very important variable. But in spite of this, we can increase our understanding of these reactions if we can make studies in situations where we have access to all the data.

Boston: To take up the question raised by Mr. Speier, there seems to be a crucial difference between peacetime disasters and the war situation, not only because in war the damage is inflicted by hostile persons rather than "fate", but also because in peacetime the reactions would be comparable only if there were a chance that repetition of the same kind of disaster would occur. In general, after the disaster is over, people are generally reassured that a repetition is not to be feared, after a tornado, for example. It may be different in case of an earthquake when people are warned that another quake may be expected within the next three hours.

Blaxucur: There is one defect that should be noted in the study of "wartime".
Blaxucur: that is that you have a selected population in disaster areas: that there is pre-knowledge that the disasters may occur. The people who are most liable to shock probably have moved to other areas. This also applies to losses: occupations - otherwise it would be good to study them too. People who know the hazard and yet go on are not the types we would like to study. Of course disasters (like the one at Texas City) also occur but it is good to bear that point in mind.

Bell: There is another point - I think it is dangerous to induce too much from study of either peacetime or wartime disasters, and to extrapolate to other populations. For instance, literacy and predispositions among Russians are different - their reactions may be different from those of any other group we have been studying.

Jenkin: I have mentioned already that when we have a full personality description, e.g. of the Russians, we may study people with similar personality structures.

Tolstoi: This is not completely necessary, because despite the Iron Curtain there are many Soviet citizens in Central and Western Europe who could be studied. Our studies could and should be made but to my knowledge no such systematic investigation has been launched. By generalizing them we could learn much more about civilian

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reactions to the military disasters the Soviets endured in 1941-42. Secondly, knowledge of the Russian personality structure would greatly increase our prevision of their future reactions. Our present negligible knowledge suggests that they would probably be highly disturbed in conflagration; they would apparently be more disoriented than other people. I don't know, but there are some well-versed people who believe this would be the case.

Devison: Mr. Janis mentioned in his memorandum the use of color films for studying reactions. This would have certain advantages as well as disadvantages. The U. S. has facilities for distributing color films in many countries. For instance, we could show the films in the Hiroshima region and compare reactions to the film to the actual reactions about which we are informed. This might be better than trying to find similar personality types. Furthermore, films could also be used for communicating threats.

Boston: Well, our films may be shown in many countries except in Soviet Russia. That is the country where you have no access except with their own consent. They do not show any American films except films of no consequence or those which reflect negatively upon American society.

Hall: This points to a possible research project: we could question Russians recently out of Russia with certain objectives in mind. We need technical information, but this need not be mentioned here. Secondly, we could ask question relating to those problems.

Spiro: To summarize what was said about short-range effects: the method of studying peacetime disasters was mentioned; then the method of questioning Jewish refugees; and also the use of color films. Now let us turn to the consideration of long-range effects. This would include some long-range radiation effects.

Janis: Long-range effects among survivors:

Spiro: Yes, was not that your intention?

Stephens: There's an even broader question than that - long-range effects upon the enemy as a whole, resulting from the first shock. Such a study might lead to a re-evaluation of the potentialities of the weapon. The effects may turn out to be quite serious, if the damage in terms of manpower and production facilities is very heavy.

Letting: How long is long-range?

Stephens: From the event to whatever period we want to examine. For instance, the nation could be so seriously ruined that it could not go on with the war and would consider surrender. We might of course over-estimate the damage and underestimate their capacity of recuperation.

Koenigsmann: Could we envisage long-range political effects?

Spiro: It was my understanding that we would concentrate more or less primarily upon the psychological rather than the long-range political, economic or administrative effects.

Janis: I suggest we consider one of them concretely, that is, unauthorized evacuations produced by various threats. The question is what type of threat

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would be most likely to lead to unauthorized evacuations and all the resulting confusion and disruption.

Goldschneider: We may assume that one of the effects would be increased mobility of people - that is, people would leave the cities not only because they are actually uninhabitable due to radiation, but because they anticipate an attack; then the question is whether we are interested in mobility as such, or rather in controlling mobility so as to minimize disruption. It might be possible, although this sounds a little far-fetched, to produce a herding effect - corralling people, as it were, in a small area which would be declared safe. There seem to be certain possibilities in this, recalling certain tactics the Germans applied in France.

Leffers: And closely allied to this is the possibility of producing two refugee columns which would use the same road in opposite directions, so that a complete impasse would result.

Boston: Has any use been made of sodium pentothal interviews with survivors of ~~disasters~~? Such interviews could be very valuable. This would be a way to test out some hypothesis concerning reactions to traumatic situations.

Goldschneider: This has been done very extensively with psychiatric battle-casualties during the war in all armed services, using sodium pentothal and sodium amytal. The interviews did reveal acute anxiety states.

Wall: Another technical point may be mentioned here. At Oak Ridge and elsewhere there has been extensive study of genetic mutations induced by radiation. Many mutations have been observed, but the long-range genetic effects are still unknown. It would be important to study this, because if the effects are considerable, certain moral questions are involved; in my case, there may be a propaganda point here.

Freudman: This propaganda point would tie in with the Russian biological doctrine which is one of the weak points of Russian scientific culture we could attack.

Briggs: But the Russians minimize the importance of genes --

Freudman: The Russian idea is that man can control his destiny, hence no other man can control Russians.

Deming: I agree, but we need not talk about genes - it is sufficient to talk about the "environmental" effects. Now I have one question to ask. The physiologist: what are the chances of studying effects on people who work in laboratories - that is, chemists and the rest. For do they react to the threat of accident?

Freudman: There again you have a selected sample; however, then a new event comes along which represents a hazard not previously known, but may considerably have a field for study. For instance, we just learned that exposure to fast neutrons may result in cancers. I know of at least one man who has no interest but is so deeply disturbed that he is probably going to leave this line of work. It seems this is the type of case you should study rather than endemic threat situations.

Deming: We may study people who want to leave this field, - but which class of personnel would it be best to observe? Scientists? Inspectors? Clerical personnel?

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Griggs: Physicists in general are very slipshod about the way they handle dangerous materials.

Jenkin: Why do you think that is so?

Griggs: Oh well, they are just too lazy to take precautions. They are more anxious to get results than to be safe.

Ridgeway: Yes, and also radiation danger seems so remote and imperceptible that it is hard to appreciate even when you understand its nature.

Bostrom: Of course, they do not really accept the threat.

Ridgeway: On the conscious level, they know it is there, but emotionally it is hard to recognise how serious it is.

Hull: genetic mutations have been minimised, but there are also serious somatic mutations, for instance a degeneration of cells in the bone marrow causes leukaemia, the incidence of which is much higher among radiologists than among other people.

As is well known, this is a very painful, deadly malady. You would think that anyone in his right mind would stay away from radiation. Those who may are very brave - or some people would say they are dares,

Hull: Technicians may refuse to take the threat seriously. In the other hand a layman may not believe in it until he sees the effects.

McGinn: I recall one tragic case which occurred at Los Alamos. Those people learned about it, they became very much impressed into the danger.

Melton: I am afraid we now have to close the discussion.

I shall resume the session at 1:30 P.M. when Mr. Ridgeway will speak on our area panel.

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JANUARY 27, 1949 - FIRST AFTERNOON SESSION

RADIOLOGICAL WEAPONS - AREA DENIAL

Ridenour: My general topic will be the "denial of areas" by the use of radio-active substances spread out in sufficient quantities. My qualifications to treat this subject are mainly negative; I know almost nothing about it. There are several people in this room who studied this subject far more deeply than I have, and know a lot about the effects of radioactivity. Their knowledge, however, was gained under the auspices of the Atomic Energy Commission and cannot be communicated, whereas whatever I know I have learned from unclassified sources. The story I am going to give you may be incomplete or even wrong, but at least it is going to be legal. If anything I should say were to contain classified information, it is not because I had access to such material, but because I guessed it by coincidence.

First, something about the elementary physics of this matter. As you know, there are in nature about 81 stable elements; each of these occurs in more than one isotopic form; the total number of isotopes at present known is about 250 to 270. If we plot the "atomic numbers", Z and the "mass numbers", A on a chart, then we shall see that the range of differences $A-Z$ form a very narrow band comprising all the stable elements; all the others are unstable and transform themselves into other elements, ending up with stable forms. The unstable forms are radioactive. We can produce them in a laboratory; but in the cosmic laboratory of nature, too, a number of unstable radioactive elements have been formed and are undergoing a characteristic transformation.

The process of radioactive transformation cannot be influenced by outside interference. This is important because it follows that no countermeasures are possible by which radiation can be stopped.

Radioactive degeneration is a chance process: the probability that a given atom will disintegrate and give off radiation is the same for all atoms of a given kind at any moment of time. For an aggregate of radioactive atoms, then, the process of transformation will be exponential; if we plot the number of atomic transformations against the time coordinate, we shall get an exponential curve, and if we take the logarithm of the number of transformations we'll get a straight line. It is convenient to speak in this connection of the "half-life" of each radioactive substance, that is, the period during which half of it reaches a stable form; this remains constant for each unstable element and is a characteristic of it.

The shortest half-life of which we know is 10^{-11} seconds, the longest is of the order of the age of the universe - the order of 10^9 years.

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The phenomenon of radioactivity was first observed in natural radium which has been used mainly for therapeutic purposes. The entire amount of radium produced in pure form since the discovery of radium (about 50 years ago) amounts to 2 or 3 kilograms. The amount of radioactive material which can be produced in high energy reactors in a second is many times larger than that of the total quantity of natural radium processed. In reactors at power levels of thousands or millions of kilowatts, perfectly astounding amounts of radioactivity could be produced.

In radioactive radiation, we can distinguish three types of rays, designated by the letters α , (alpha), β , (beta), and γ , (gamma) each of which differs in penetrating power. The α particles (helium nuclei) emitted in radiation have a penetrating range of about a few centimeters. They could have poisoning effects if injected into the organism, but if they are merely propagated in the atmosphere, their effects are unimportant. The β particles (free electrons) are very energetic, and lose their energy less rapidly than the particles when they pass through matter; but they again do not range very far through the atmosphere; electrons of 1 mev penetrate a distance of about 1 meter in air. They easily produce harmful effects at close ranges but not at longer distances. The third type of radiation, the γ -rays, consists in fact of what is known as X-rays. These are rays of a higher frequency and shorter wavelength than visible light - maybe a million times less. They interact with matter by interacting with the electrons present in matter, imparting parts of their energy to the absorber, thus producing secondary electrons which have an ionizing effect.

What are the physiological effects of being exposed to radiation?

The body is a fairly complicated chemical system which depends on quite intricate processes to maintain its equilibrium: the reactions by which this chemical balance is effected are controlled by complicated chemical structures like the enzymes. These may be destroyed by radiation of quite low energy levels, such as 2 or 3 mev; hence when γ rays pass through an organism, the energy imparted to the secondary electrons is sufficient to destroy enzymes, or protein molecules.

We can distinguish two or three effects of such disruption:

- (1) Radiation may destroy the ability of a molecule, so that it will not be available to fulfill its normal function in the body.
- (2) It may alter the activity of the molecule in such a way that it will do active harm.

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In this latter case, we may properly speak of mutations: the cells continue to live, multiply and metabolize, but they do it in such crazy fashion that the whole organism cannot function normally. "Somatic" mutations of this kind may lead to malignancy, e.g., leukemia which is a frequent consequence of exposure to radiation; this may cause the death of the organism.

In the first case, too, the organism may be destroyed, if the number of the molecules disrupted is large enough. Radiation of a very small energy may kill the human organism if the whole body is exposed; the reason why X-ray examination or treatment does not kill you is that the radiation is concentrated upon a small part of the body.

Depending on individual resistance and circumstances, the tolerance of the body for radiation is between 400-1000 R for the whole body; 1 mg of radium at a distance of 1 cm. produces 8.3 R per hour. The effect diminishes with the inverse square of distance; hence in order not to get harmful doses, the best thing is to stay away from radiation. There is a certain maximum amount of radiation which can be absorbed day by day without harmful effects; this is about 0.1 R per day.

Now as to possibilities: Using present-day powerful reactors, we can produce almost unlimited quantities of radioactive substances; instead of milligrams and grams, you can have the equivalents of kilograms of radium - with this difference, however, that we have a wide range of half-lives which we can choose according to what we want to achieve. The concentration of radioactivity depends on the half-life. In short, we get big radiation intensity from a small amount of material which degenerates quickly, and if the half-life is long, we must have larger quantities of material. Uranium, for instance, has a very long half-life (a billion years), and this is why so much uranium must be processed to get a gram of radium (half-life of a little over 1500 years).

One more point about the manufacture of radioactive materials. Here there are two major possibilities.

First, take fission products. If uranium is fissioned, we obtain from one uranium atom two atoms of other elements which are unusable and freely going through several intermediary stages. These fission products must be removed if you want to produce plutonium, and since the longer elements contained in this fission process are all radioactive, you may use them to get radiation effects.

Second, you may use neutrons in a pile to bombard stable elements and make them radioactive. The same bombardment technique is also used in making plutonium; and it depends on

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whether you use neutrons to transform uranium into plutonium, or to transform a stable element into a radioactive one. Plutonium with its long half-life (20,000) can be stored; stable elements artificially transformed into radioactive ones have short half-lives and decay quickly and cannot be stored. On the other hand, these latter have the advantage that you can specify the type of effect you want to obtain.

For the denial of an area, the idea is to spread radioactive material over it so that the uniform density of radiation will be 25 to 100 R per day; 10 days of exposure, then, would be lethal, and even one hour would be higher than the harmless dose.

A rough calculation shows that by using radioactivity equivalent to 1 million grams of radium, that is, 1 million curies, it is possible to saturate an area of a square mile with a radiation of 25 to 100 R per day.

How can this material be disseminated? It seems that this question requires further study. One may use aerosols, but this method is not too efficient, since the particles can be blown away or washed down by rain; it can also produce instantaneous death and this would change the psychological picture, since the idea would be to give the population a possibility to escape harm by moving out of the area. If, on the other hand, the material is placed in bigger lumps, military squads or trained personnel could remove it from the area. Presumably, the best way would be to choose particles bigger than an aerosol particle but smaller than a matchbox.

If you have radioactive particles of a half-life of about a month, then the natural mass of radioactive atoms you would need would be about 50 g, which would have to be mixed with inert material. An area of a square mile could effectively be sprayed with this. However, you have to consider that the bomber crews would be exposed to radiation while transporting the material, and in 10 hours they could get a lethal dose. This question would require detailed investigation. Possibly, the material could be transported in a towed glider, or in a radio-controlled unmanned airplane directed from a mother plane. In this case, delivery may be feasible. This about exhausts what I can say about the radiation weapon.

There remains one point to be discussed: how does this compare with the A-bomb? The difference seems to be mainly psychological, and that is what we are concerned with. The main thing is that there are fewer objections to this than the A-bomb, because you do not destroy a city by this means but merely make it useless for a period you can specify. Also no large number of people need be killed or maimed if they follow instructions. Furthermore, one disadvantage of the A-bomb I have been wondering about will be eliminated; that is, if several A-bombs are dropped in a raid, then the first blast discharges radioactive particles into the air which will be carried arriving later, - or the first explosion

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Brodie: Any danger that the material will drift back to your own territory?

Ridgeway: The probability is not very high, and may be kept under control. Also, you have to consider that if you use high explosives, it takes about twice or two and a half times as much to destroy the machines in a factory than to destroy the building; hence destruction is easily over-estimated if we look merely at photographs. But if radioactivity is used, you may be sure that the entire area is useless even without any physical destruction.

Coale: Could the machinery not be removed by suicide squads?

Ridgeway: Maybe, but that would be a very unpleasant job and you would be causing much trouble.

I would like to make one more comment about passive defense. As usual, the best type of passive defense is to be somewhere else. If you are in the area, you may be protected by adequate shielding, but "adequate" means very thick - ordinary roofs and walls are quite ineffective as means to diminish the dosage. Underground factories may be safe, but it can hardly be imagined that a whole economy would go underground.

Goldschmidt: What is the estimate of the cost of denial as compared with the cost of atomic attack?

Ridgeway: My guess would be that square mile for square mile the cost would be about the same.

Boatner: Is all this information unclassified?

Ridgeway: I told you nothing that could not be deduced from unclassified published material.

Coale: I would like to point out that half-lives are inversely related to the concentration of radioactivity rather than to the amount of γ units you get.

Ridgeway: Well, there was a simplifying assumption in what I said, and the result may be wrong by a factor of ten per cent.

Rosenblatt: It is difficult to see how an entire country like the Soviet Union could be bisected by erecting an impervious barrier, if denial of a square mile costs as much as devastation by A-bomb.

Ridgeway: The areas should be chosen very carefully bearing in mind the costliness of the operation.

Sykes: It would cost too much to lay down a belt.

Coale: There is another point of comparison between the radiological weapon and the A-bomb, and that is that with the A-bomb you cannot go below a certain minimum unit of destruction which it would be unconomical to waste on a small but vital

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object. With the radiological weapon, you can choose the total dose you wish. It is divisible at will.

Speaker: Any further questions?

Rosten: My question concerns the possibility of getting protection against a sudden RW attack. I imagine it would be a pretty costly defense enterprise if we wanted to put shields around buildings we want to protect. And it would have to be done quickly.

Ridenour: That would be fair to say. You could get some protection from sand bags. If you desire to go to enough trouble, you can make part of the square mile pretty safe.

Coats: How many square miles could be devastated by an underwater burst?

Ridenour: I don't know how to estimate that, but I suppose if an A-bomb is exploded under water, it would make a few square miles hazardous to live in for at least a couple of reasons. One of the hazards involved would be poisoning by unburnt plutonium. The efficiency with which the bomb is exploded is not known to me but there must be a few per cent left over. Apart from the CT particles, then, which will cause severe radiation sickness, you have this plutonium which is very poisonous. Half a microgram of plutonium if it penetrates the skin is lethal.

Parisi: Supposing that the enemy wants to use an area which we want to deny them, could they develop adequate personnel equipment to shield the workers?

Ridenour: Shielding is something you can never get absolute about. The law of absorption of these radiations is also exponential, that is, you get half the intensity after each layer of a certain thickness. It seems they could move around if they used armored tanks - then it depends on what you want to do and how fanatical your personnel is.

Speaker: Would it be possible to use material that is soluble enough so that it won't be washed away by rain?

Bridges: There seem to be some fairly easy ways to convince to operate in a contaminated area. First, the enemy may resort to compulsory labor. Second, surveys could be made of the area to determine spotty concentrations and map the areas that are safe from one day to the next. Unless other facilities are disrupted, this appears to be quite feasible.

Goldhammer: Why is it necessary from the standpoint of denial to have uniform saturation? If the material is spread over a large area unevenly, is that not sufficient?

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Midanour: There are a couple of answers to that: First, the possibility mentioned by Mr. Griggs, namely that decontamination squads are used and quickly spot the areas which are no longer unsafe. The best way to prevent this is to make your coverage as uniform as possible. But it all depends on what you want to accomplish.

Roatson: Even if parts of the area is safe, the people cannot live if they are coated up and immobilized. I think this is what Mr. Goldhauer meant when he spoke about the desirability of covering a larger area.

Griggs: It would be important to examine the psychological effects of infra-lethal doses. Suppose you use a dose such that you could stay in the area indefinitely without dying; there yet would possibly be important psychological effects.

Janis: I would venture to say that as of now there would be no such psychological effects. We have to educate the people as to the imperceptible danger which is there. If there is no visible physical effect, it is as if the thing did not exist.

Griggs: What observable effects would appear before people develop any symptoms? There may be tests which would reveal the presence of radioactivity, such as the fogging of all photographic plates. People would be scared if they observed such phenomena.

Roatson: Would the radiation impart radioactivity to exposed objects?

Midanour: No.

Roatson: Any other observable physical phenomena?

Midanour: Many people are engaged in measuring ionization, and they would see unusual things.

Griggs: Would radio sets show unusual effects?

Midanour: "Radiation", although it's the same word, has no effect upon "radio transmission".

Roatson: Could there be an effect upon radio beams emitted by radio airplanes?

Midanour: There would be indirect effects from very heavy radiation. But there such effects could be observed, the radiation itself would be latent.

Midanour: Public health clinics - which I presume exist also in the Soviet Union - could be equipped with Geiger counters and photographic badges. We could advise the Russian medical people on how to tell when there is dangerous radiation, and export to them supplies of detection equipment, photographic badges, etc.

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Or we could give deceptive information, start rumors, to induce fears. After an explosion occurs in this country (such as the one in Texas City), we could stimulate rumors that it was this kind of material that we were producing, that it has gotten out of hand, and donate a shipload of deactivation equipment. In any case, I would like to make the people in the Soviet Union aware of the lethal possibilities of this weapon.

Leibowitz: I suppose there are many tactical and strategic devices, and it is not difficult to exploit them for purposes of PW. However, the main question is who perceives what. I would like someone to contribute something regarding Mr. Janis' comment.

Leibowitz: Mr. Goldhamer spoke of the possibility of spreading material thinly over a larger area. Would it be possible to bring about different coverage in various city areas, and obliterate a few blocks by pin-point bombing? A warning could be given; some people would die, and the others would be aware of an acute danger. I may be wrong, but it seems to me that in certain cultures certain metaphors are very effective. In the Soviet Union, penetration words are used. Fear-provoking; in their communications, the fear of reported agents plays a considerable role.

Leibowitz: In the interview of who perceives what: Could the material be made visible in the dark?

Leibowitz: I was not thinking about that. In just a few years, the oil glands might fill upon a beer bottle or some other object which could become fluorescent under sufficient ultraviolet radiation. But I'd suppose you would not want this to happen very often since it is better not to sacrifice the functionality of the weapon.

Leibowitz: If such a particle were injected in the mouth, would it be possible that teeth would begin to glow? and would the effects be fatal?

Leibowitz: It might happen - but it need not be fatal, it would be very bad, the dose was.

Leibowitz: Would radiation have any effect upon vegetable matter?

Leibowitz: Well, yes and no. It has an effect on living tissues, but it is not mobilized by the plant. It wouldn't have any effect which would be carried over if the plant were used as food.

Leibowitz: The presence of any fluorescent material would quickly start comment; it is unthinkable that it would not be noticed and talked about.

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Ridenour: In 10^{10} particles of a total activity of a million curies the activity of each particle would be enough to make things fluorescent within a millimeter or two, and there is a fair chance that this would happen in a few instances.

Lisszwell: Could small animals show any discomfort before human beings?

Ridenour: No, unless they eat a few particles.

Brooks: It doesn't make much difference whether it's in the body or outside.

Ridenour: It would in the small intestine, I think. Now the general answer to the question of perceptibility is that you get perceptible effects with very heavy concentration. If the concentration is such that people die within 10 days, then you get many well-known symptoms. The first symptom might well be nausea.

Lisszwell: It would be very important to know the sequence of symptoms, and the mortality rates from various concentrations.

Ridenour: It would be possible to pass down a concentration limit that half the people would die in ten days.

Brooks: Inability, the apparentlessness of lack of perceptibility could be turned into an asset if, after the announcement that the area had been contaminated, people were first cynical about it and didn't believe it and then began to develop symptoms after 10 days. It would be valuable if the enemy could get people convinced our warning which would turn out to be correct.

Brooks: I understand there are also gases which cause nausea, and gases are cheaper. Could we not produce panic by simulating an NBC attack by using such gases?

Plimpton: There's one comment I'd like to make, and that is that to deliver things like gases or bacteria, you have to insure injection and there are simple ways of preventing that, so it is uncertain whether you'd get the desired effects. Also, the question is where the effect would be attributed to a gas or to injection.

Spivack: I think the question is what agency you want to take action. If your aim is to induce the authorities to take action, it is sufficient that they know it is radiation; it is different if you just want to create masslessness and panic among the population. In that they could exert pressure upon the authorities.

Davidson: Would it be possible to impregnate small objects with radioactive material which would harm the user?

Ridenour: It would be possible to manufacture such objects.

Plasnet: Conventional poisons may be more effective for this purpose.

Lansdell: Are there any significant difference in the responses of human beings by sex or age?

Ridenour: None has been identified so far.

Griggs: Female reproductive organs appear to be more susceptible.

Ridenour: There are several different mechanisms causing death that operate at different levels of dosage. At low levels of concentration, death may be due to extraneous causes, such as making your small intestine permeable so that you die of peritonitis; or by killing the bacterial flora of the intestine you lower the number of white corpuscles and you lose your resistance to infections and may die of influenza. At higher concentrations, you get direct radiation effects.

Lansdell: Would it be possible to get some estimate on the selection of these mechanisms of death, e.g. a relation between the dosage and the days of survival?

Ridenour: There is a practical curve which is established for mice, correlating the dose with the days of survival. That may be applicable to people.

Janis: We come back to the possibilities of higher dilution: suppose you reduce your optimum concentration to one fifth and spread it, say, over the area of New York. How quickly could warning signs be set up?

Ridenour: The police if properly trained could do it in about half a day.

Janis: As to the psychological effects: the fear of symptoms would be just as bad as the fear of death. Could you say something about non-lethal symptoms?

Ridenour: Some of the symptoms are obscure, not to say trivial. One of the earliest is that you lose your finger-prints. The tips of the fingers become smooth.

Janis: How about such symptoms as miscarriages, amenorrhea, or sterilization?

Janis: Most of the people who lose their hair would probably die.

Janis: Is there any effect on cuts?

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Briggs: Healing would be delayed.

Ridenour: Lowered resistance in general may be an important factor, especially in conjunction with bacteriological weapons.

Speller: Since it's 3 p.m. past, we have come to the end of this meeting.

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January 28, 1949: Morning Meeting

CAPABILITIES OF A SATELLITE VEHICLE

Lipp:

You all have noticed headlines in the press about the satellites. The press is apt in such cases to pick up information and magnify it; hence, although this meeting is unclassified, I would request you not to use any information conveyed by this discussion in any publication.

Now to take up the subject of satellites: they are qualitatively different from any other weapon, in that their primary purpose is not to destroy things.

I shall begin the discussion with a large assumption: this is that rocket art has reached a point where it is possible to produce a satellite.

A satellite may be defined as a body moving around the earth at the outer edge of the atmosphere at such a speed that the centrifugal forces balance the force of gravity; hence the body remains up indefinitely, coasting on its momentum like the moon, for instance. The problem consists in giving it enough speed to enable it to do this.

There is an unclassified report which considers in the upper atmosphere on the basis of which we can estimate the height at which satellite motion becomes feasible. It can be seen that any object must be at least a few hundred miles above the earth's surface in order to be a satellite; otherwise the atmosphere would drag it down.

At such an altitude, a satellite would take a period of 12 hours in going around the earth. In another 12 hr, when the period would be 24 hours, or just around the earth this is the required altitude would be roughly 10,000 miles. This larger orbit would require higher periflars, which is easier to achieve than the smaller orbits.

It is important to know that at the present stage of development, we have to assume that the proposed satellite will carry weight as necessarily much, "water ball" a satellite

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with higher payloads will be possible, but the payload now is limited by performance capabilities. This is the main characteristic of any present era satellite: it can carry only small things. For instance, an atomic bomb "fits" too much to be transported by a satellite. Other nonpossibles, of course, are far more bulky for the same effects.

The uses of the satellite, then, are largely limited to the following: communications, spectacles and operations, and observation. Scientific measurements (cosmic ray studies, etc.) can also be made, but are not of major interest at this meeting.

Now consider the 1½ hour period of revolution in relation to the earth's rotation.

If such a satellite is set on an oblique orbit, the orbit will be circular and will remain in the same plane (containing the earth's center) while the earth revolves; then, during each period of revolution, it will follow a different path relative to the surface of the earth - it will appear above different points each time it circles the earth. If the satellite's period is not a fraction of the earth's rotation, its path will be different in each day.

If a satellite is 500 miles up, it will be visible at a distance of 7,000 miles. The best orbit for visibility will be "near" (or before) sunset - possible for one hour. If the track is "instant" (i.e. it will reflect the same rays while 700 miles below), it is always.

Radius:

Would it be visible to the naked eye?

Height:

If you are in the dark soon after twilight and the satellite is illuminated by sunlight, it will be fairly visible. People who happen to notice it will have the impression that it is something unusual. (This is the reason the first satellite to "go around" could not be identified as a "satellite" because it was so bright it was like the sun.)

Orbits:

Orbit, the satellite is made to "rise" and "set" in a stream of sunbeams.

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Line:

If the period were one day, the height 72,000 miles, and the orbit equatorial, it would remain over one meridian, and appear to be traveling up and down that meridian. It would rise over the South horizon, rise to a certain point, and recede southward.

Stations:

Would the apparent magnitude vary? This would be very mystifying.

Line:

Trained observers would easily calculate its main characteristics from its apparent size and speed and then infer it's an artificial body. It would certainly not be taken for a meteorite.

Speed:

Certainly the speed should be kept within limits - otherwise it would drift away.

Line:

If the speed is too high, the orbit will be elliptical.

Launch:

Would more satellites be set up?

Line:

That's a question of expense. A satellite would be quite valuable.

Launch:

How much initial visibility is necessary for using. I.P.T. 1 or 2nd magnitude?

Line:

A small telescope might succeed in tracking the object. A large telescope could probably not follow its movement; it's too

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Boston:

Terrestrial observers could certainly not see what's inside.

Lipp:

They could calculate its probable mass.

Poston:

If astronomers see one that's white, could they not suspect there are invisible ones?

Lipp:

If a satellite were painted black, it would be invisible.

Poston:

Could a black satellite not be discovered by telescope?

Lipp:

Probably not, but it is not altogether impossible.

Poston:

Would the temperature inside the satellite not show extreme variations - say, from near absolute zero to very high temperatures?

Lipp:

This is not very likely, because the period of revolution would be too short for cooling down or being heated too much.

Poston:

If foreign astronomers establish the existence of a satellite, they not infer that the U. S. has longrange guided missiles?

Lipp:

I am sorry, I don't know how to answer this question in an unclassified manner.

Poston:

Still, it is possible to speculate that they might guess that these might be a longrange missile.

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Lipp:

Anyone would deduce that the satellite would not have an explosive payload.

Jenks:

Then it would not have a frightening effect - not at least, upon the government.

Davidson:

X Would not the existence of the satellite convince others that rocket technology in the U. S. is highly developed?

Rosen:

They would infer, at least, that we can generate enough speed to launch longrange rockets.

Lipp:

f Long-distance rockets would have to approximate the speed of the satellite.

Brooks:

Then, if it is so expensive to generate that speed, the others could infer that we can have only a few small rockets (without warheads), since it would be too expensive to procure bigger ones.

Keppler:

Also, would the high speed not eliminate fears concerning the rocket's accuracy?

Moore:

I think everyone agrees that the airframe and ICBM technology is sheet of incinerator of guidance.

Keppler:

It seems, then, that they could not infer that we have longrange guided missiles.

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Lipp:

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That they would infer would only be the generally advanced state of technology in the U. S.

Posten:

Is there any reason why others must assume that the guidance problem lags behind? If, for instance, foreign scientists assume that we have the equivalent of the Manhattan project, they must admit the possibility that we develop real guided missiles. Hence, there is no need to discount speculations about the military possibilities.

Lipp:

After the war ended, the Russians took over much of the advanced rocket work done in Germany, and their German scientists can estimate the time that is needed for developing guided missiles. They could give the Russians a fairly good idea of that.

Posten:

But would the Russian government tell the Russian people?

Lipp:

If we see a satellite crowded by others, would we not infer that those who made it stored them have guided missiles - or will have them eventually? How long would they need to produce one? Ten years - or a hundred years?

Lipp:

I think the time would be of the order of ten rather than a hundred years.

Posten:

The acceptiveness of the satellite would appear to be about this. Since technology in the belief that would be big to make military isomeric is imminent.

Lipp:

Don't forget that the Germans have the right to investigate the satellite problem.

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Ridemour:

In principle, the satellite has been feasible ever since the V-2 rocket was developed. At what time guided missiles will be available depends only on how hard you work on them.

Hostett:

The German scientists may estimate that we shall have guided missiles in five years.

Ridemour:

Or that we are stupid if we do not concentrate on other things instead.

Hostett:

The Soviets would, however, have to revise all their military calculations if they estimate that guided missiles are nearer in time.

Heiland:

They need not revise all their calculations, since they may recognize that we are technically superior.

Irodia:

Besides, even if we have guided missiles, this does not mean that there will be no use for bomber aircraft.

Kassaroff:

What possibilities are inherent in varying the color of the satellite? This might affect the payload - for instance, if the temperatures were higher, say, in a black satellite. Will the satellite have its own source of light?

Light:

The color of a satellite may be varying, but whatever color and whatever type is used, visibility will be least. A source of light inside the satellite is highly feasible because it would have but much weight. As to temperatures, in any case I don't think it would be much below freezing or above the boiling point.

Perlman:

Could fluorescent paint be used?

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Lipp:

It would not have enough brightness to make it visible to the naked eye.

Kapton:

Is the major limitation only the weight?

Lipp:

The weight of an auxiliary power plant must be reckoned against the payload.

Hidenour:

Could it be possible to use mirrors to produce flashes?

Lipp:

Yes, if the sides of the satellite were flat, and made of shining material, it would be a mirror.

Goldman:

Could it then produce periodic flashes?

Lipp:

If its sides were flat mirrors, and if it could spin, then it would reflect the sun's rays in all directions. But any single observer would see only one flash.

Hidenour:

But there would be many people who see a flash. The brightness might well be greater than that of a star of first magnitude; it might even be visible in daytime.

Kapton:

Yes, just the kind of it would be possible. You will see it at night. In daytime, you must look straight in the direction of Venus to see it.

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SPECIAL UTILITIES

Linn:

Now, say I talk about the communication uses of the satellite? With a very moderate power plant, it might be possible to make it carry a transmitter - for code messages or even voice. However, microwaves would have to be used to penetrate the ionosphere, and you need a powerful receiving instrument to detect these. The chances are that only few people would detect the message-mostly radar technicians. A few amateur sets could pick up microwave communications. It might be worth while to investigate the possibility of any chance reception. But to make the chances high, too much power would be required.

Lasswell:

Would it be possible to use balloons or planes as relays to amplify the messages?

Linn:

We could not send them up high enough; it would be too difficult.

Galbraith:

We know there are radio hams in Soviet Russia; they operate all the time. Would it be possible to construct a message that would make them think they are listening, say, to Saturn?

Linn:

They would calculate the direction from which the signal comes.

Lasswell:

Well, they now know that the satellite can... it had to use longrange rockets? Could we intimate this?

Linn:

That would be possible.

Galbraith:

If a relay were used, the listeners would identify it as a source.

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Letter:

In connection with the communications use, the main question is whether it would add a distinctive new possibility to the communications possibilities we have now. Would it enlarge our scope of communications?

Lipp:

No; the only novelty could be of the nature of curiosity.

Kecakemeti:

For how long could the satellite continue to send? Certainly not forever.

Lipp:

Definitely not. For some weeks or months.

Stephens:

Would it be possible to install a solar engine?

Lipp:

It probably would not furnish enough power and would tend to be very bulky.

Bradley:

Would it be possible to use the satellite to take pictures? And could it send the pictures back?

Lipp:

With appropriate techniques, that would be possible.

Stephens:

Or, in respect to use high-flying aircraft.

Letter:

There would be a legal point involved in its use for reconnaissance purposes. Could not that violate sovereignty?

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Posten:

There is no legal responsibility. All we do is to send it up at one point - the earth does the rest by revolving under it. The other country would simply get under the satellite.

Goldsen:

What could the satellite send?

Lipp:

Possibly even television pictures.

Leites:

Does it enhance televising facilities otherwise available?

Lipp:

Television follows the line of sight, hence we cannot reach Russia by terrestrial television.

Leites:

It seems we must distinguish between broadcast and television effects. The novelty of broadcasts - the curiosity effect which is the only one - would wear off.

Lipp:

We might like to combine communications and other effects. For instance, if the satellite were black and sent a few broadcasts, it would be very mystifying.

Leites:

I admit that the broadcasts would make an initial impression, but how after that? It does not make much difference from what source a message comes.

Posten:

Oh yes, it could make a difference. "God bless you" has quite a different effect from "This is God, blessing you." It may be possible to produce a continuing effect by varying the technique.

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Lanswell:

Technical people would figure it out with a relatively few uses - hence they would be able to take countermeasures.

Boston:

Is it possible to send television messages to or from the satellite?

Lipp:

Both.

Brodie:

But if you want to pick up a television image, you need a directional antenna, and it must be turned around to keep track of the satellite.

Lipp:

That's correct. Hence it is hardly possible that images would be picked up accidentally.

Leiter:

Would it be possible to send images of strategic installations which experts could interpret?

Stephan:

Could transmissions be jammed?

Lipp:

That would be quite easy, since the signal would be faint.

Sneier:

It seems safe to assume that there would be little jamming since only relatively few people would receive the signals. The problem would be getting other than jamming the communication.

Davison:

I believe neutrals would protest quite vehemently if the satellite appeared above them; they would be quite apprehensive. Could it be possible to choose its orbit so that it would appear only above the U. S. and Russia?

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Lipp:

There are not many choices. First, it could be put so as to follow the Equator; second, if it orbits could be oblique to the Equator, and then it would cover the earth's surface up to a certain latitude; and extreme case would be a North-South orbit which would cover the entire earth from pole to pole.

Levinson:

Then it would be difficult to devise a communication policy for it, since it would come into contact with so many different people.

Lipp:

One could send different messages at different times.

Levinson:

As to the possibility of deceptive uses: would it be possible to make deceptive communications to the Russian government?

Lipp:

Yes - for instance, if it were kept secret, painted black, and emitted random noises at odd times over Russia.

Levinson:

But could this not preclude other uses? If it were merely said to "puzzle" the audience, it could not put it to any "specacular" use.

Lipp:

If it has been painted black, it must stay black.

Levinson:

Could the paint not wear off?

Lipp:

Or could it not change its color? It might shed successive layers of paint.

Lipp:

It could not rub off its paint, since there is no atmosphere.

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One might use paint that disintegrates in time.

Belmont:

I doubt the possibility of any deception, since the origin could be easily inferred.

Lipp:

Well - if we began getting mysterious noises, we would be reluctant to believe they come from an artificial satellite.

Stephan:

Would it not be believed that the phenomenon is purely psychological, like the Flying saucers?

Kaplen:

In any case, the Russians would be mystified by the possible uses of the satellite?

King:

One possible procedure would be this: We could announce that we have it, and that we use it for purely scientific purposes. Then we let them speculate as to what other purposes it might serve.

Goodsen:

We could broadcast information gathered by the satellite

Step:

We could communicate to the Russians the blueprints, say, for receiving sets, and offer them any help in obtaining messages from the satellite.

Wienour:

We could suggest to set up receiving stations in Russia.

Dolakauer:

Would it not be desirable to have an elliptical orbit, with minimum elevation over Russia?

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Lipp:

The minimum point could not be constant.

Spicer:

I move that we recess now. After the recess, we shall take up the problem of how we ourselves can observe the satellite. This requires setting up observation points. The sites must be chosen carefully; the Russians might want to capture the observation records.

(RECESS)

(SESSION RESUMED)

Bidemour:

Another technological possibility occurs to me - if there is no air resistance, the satellite could emit balloons and leave them behind. It thus would become a bigger object - more easily observable. Is this impossible?

Lipp:

Not basically. The satellite could toss out bags. It could also toss out balloons; it would not be difficult to inflate them. It could also eject a corner reflector - a reflector consisting of three intersecting planes. That would be a better radar target. The reflector could be tied to the satellite.

Grizzel:

Would it follow if not attached?

Lipp:

It would lag behind after a time because of minute aerodynamic drag effects, but would stay in the orbit.

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Speier:

How many stations would we need to observe, and communicate with the satellite? Where would the observation stations be located?

Lipp:

That depends on our decision about the orbit. For the equatorial satellite, 6 to 12 stations would be sufficient. If the orbit is oblique, we would need 12 to each meridian of the successive revolutions - 144 in all; but some could be eliminated. Thus approximately a hundred would be needed for overall coverage of the earth.

Speier:

Many of these stations could be on ships. No prolonged secrecy is possible if there are too many stations. Also too many people would be "in the know" concerning the payload. How big a personnel do we need for each station?

Lipp:

About twelve, as a guess.

Speier:

All these would be technical personnel?

Lipp:

No - this number includes everyone, from cooks to scientists.

Williams:

Could we not conceal the real purpose of the stations? For instance, we could say they are for weather observation.

Lipp:

That might be possible.

Eidenour:

We do have observation stations in other countries. If we tried to conceal the existence of the satellite and let the others discover it, then they will believe that "what they have found out is the whole story. But if we disclose it and say the purposes are purely scientific, then no matter "what the others" intelligence says, nobody will believe that we have told the "whole story.

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Leites:

The Soviets would take it for granted in any case that we want to spy on them.

Lanswell:

Are there any possibilities for terminating the satellite for instance, to explode it?

Lipp:

It could be made to explode; then some parts could come down, others would continue to revolve. It might be possible to think of making it land. But this would require a great expenditure of fuel to slow it down sufficiently, and it would be very expensive.

Hosten:

Could we control the point at which it could crash?

Lipp:

Very roughly; we do not know enough about the atmosphere for a proper determination.

Lanswell:

Could other nations shoot it down?

Lipp:

If they were able to do that, it would be very frightening indeed.

Lanswell:

Could the enemy use it to transmit broadcasts?

Lipp:

I don't think so. They might be able to confuse the signal.

Goldberg:

It might be possible to put in a magnetic recording and transmit it over enemy territory, then demagnetize over our own territory and put in a new message. Could the Russians use this technique?

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Brodie:

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If the satellite exploded, that might increase the reflection and make a better radar target.

Lipp:

But the parts would drift apart - the initial speed would be set by the explosion, and then the parts would have different drags.

Stephen:

Thin foil would have good reflecting properties.

Ridenhour:

How big is the drag? Big or small?

Lipp:

For any reasonable rocket on the orbit it should be very small.

Speaker:

I think Mr. Lipp wanted to ask questions about the psychological effects of the satellite. Are you ready?

Lipp:

The questions I am interested in are the following: What are the psychological effects involved in the satellite:

- (1) as evidence of advanced technology;
- (2) as special psychological uses related to special payloads;
- (3) as a means of continual reconnaissance?

And three other questions concerning the psychological factors involved in the use of the satellite:

- (4) What is the proper time to announce the satellite?
- (5) What is the best way to announce it:
 - (a) exaggerate it?
 - (b) tell the truth?
 - (c) deflate it?
- (6) What is the proper time to launch the satellite - e.g. shall it be used as a means of diversion in a political crisis?

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UTILITIES AS A RECONNAISSANCE INSTRUMENT

Speier:

The discussion of all these points would take too long, and final answers cannot be given at this point. After the conference, a working paper might take up specific points. I would suggest taking up Question No. 3: the satellite as a means of continual reconnaissance.

Coale:

Shall we discuss the psychological effects of this upon both the Russians and ourselves?

Speier:

It seems best to confine the discussion to effects upon the others.

Stephan:

There could be alternative formulations of the purpose in terms of the evidence that could be gathered. We might study effects upon persons: the Peeping Tom effect. But it is difficult to ascertain this. For instance, rumors that are generated might be indicative.

Speier:

In any case, the chances of disintegrating privacy are less than the chances of disintegrating secrecy.

Ridgway:

If we disseminate the idea that it is high up and could not produce sharp pictures but only blurred ones like the rocket pictures would this not diminish fears that they are being observed?

Lipp:

Let us assume that the Russians know the truth about the assumed purpose of the satellite (reconnaissance). What is the psychological effect of that?

Leites:

Shall we assume that the pictures will show much more than clouds -- and that the satellite significantly increases our

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reconnaissance capabilities?

Lipp:

There are two possibilities -- (1) it may show only cloud formations; (2) it may show also smaller objects, down to the size of parts of a city block, but blurred.

Brodie:

Could the Russians put smoke screens over strategic objects every day the rocket arrives?

Lipp:

Possibly.

Leites:

Is this an enhancement of reconnaissance facilities?

Lipp:

Yes -- we could see important installations and determine their character in a rough way.

Stephan:

Then it seems the launching should not be announced, -- the announcement should be made only when the satellite is discovered.

Lipp:

Would this influence the Russian attitude towards international control of atomic installations?

Leites:

It is to be assumed that it would.

Janisz:

Could the satellite be used as part of the machinery to control atomic energy?

Lipp:

In time, this might be the case.

Williams:

Could they not put their installations underground?

Lipp:

That is not easy. Could you put Hanford underground?

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Stephan:

It might be easier to camouflage the installations to throw reconnaissance off track.

Spaier:

If the Russians used counterdeception, camouflage would be detected by the speed with which it is undertaken. If the speed is reduced to simulate true construction conditions, camouflage would be ineffective.

Stephan:

If the Russians can anticipate reconnaissance, they start with counterdeception right away. Hence, it would be better to hold back the announcement.

Hostett:

It might be quite useful to induce counterdeception, because it would absorb a great deal of manpower if they wanted to deceive us -- e.g. make us believe they are building an installation by putting up an empty shell. They would have to go through all the motions; that takes machinery and manpower.

Goldsen:

What does it take to put across an "ultimatum"? Could a series of photos be used to back it up?

Leites:

I feel it would be most definitely worthwhile. If our "ultimatum" includes the demand to accept something like the Lillianthal plan (for atomic control), then it is excellent if we can tell them we know anyway what they have. In general, the Russians do not know "what is going on in the world." A very important aspect of Soviet behavior is the following: The Politburo assumes that in the world in which we live both secrecy and double-agentry are possible. Hence their reliance on secrecy and their fierce purge actions against people they suspect of divulging secrets. Now this might be changed if in some very effective way we convey to them the feeling that in the world in which we now live total secrecy is no longer possible. Hence they can no longer only "suspect" that certain secrets have been breached -- they must admit it as a fact. In this way, the satellite can be used for their "re-education."

Goldsen:

It may be desirable to send up the first one as a black satellite, and disclose the results of observation to the Soviet rulers. This would start speculation about the possibility of double-agentry.

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Roesten:

Could you decisive them about the reconnaissance uses of the satellite indefinitely?

Broder:

If we delay the announcement, a certain amount of time will pass before it is discovered. After all, many comets are only discovered after a certain time. Then, when the first one is discovered, we may launch another.

Hitch:

We should not under-rate the reconnaissance value of photos for economic intelligence, combined with other techniques. During the war, we were able to extract much from the interpretation of photos, combined with other sources. If the satellite can show objects the size of half a city block, it is a valuable means of information.

Roesten:

We should examine the relation the satellite may have to our exercising certain controls within the Soviet Union. Its use may increase suspicion, induce purges and division; it may even effect a change in the Politburo.

Selznick:

We might also examine the impact of continuous reconnaissance upon the masses. This impact may consist in increasing the integration of Soviet society; the masses could be aroused if the government played up the espionage activities of foreign imperialists. They would raise a great hue and cry about encirclement.

Roesten:

Part of our problem certainly consists in using the satellite in such a way that we can control the effects of disclosure.

Selznick:

It would then seem best to withhold information about continuous reconnaissance from the masses.

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Rosten:

We may assume that the Russian government itself would keep the matter quiet; we should keep disclosure under control.

Leites:

There is not too much danger that the Russian masses will be aroused. They are generally de-politicized; and moreover, they take it for granted that the others want to observe them.

Selznick:

Still, the Soviet government might try to use the satellite as a solidarizing instrument.

Leites:

But how could they produce any impression? They're saying all the time that U. S. "agents" are engaged in espionage activities. How can you impress your public after you've told them that 85 per cent of the original (1917) Politburo were in enemy pay?

Leavell:

If the satellite has genuine military worth, this indicates its most effective use and the best timing of its use in connection with an international crisis where our objective would be to minimize the chances of a Soviet aggression, or to induce the Soviets to accept demands we make on them.

One possibility might be to lay the foundation for and to create suspicion of secession trends in outlying areas such as Romania or China (by disclosing data which could be interpreted as indicating underground activities). If this approach is taken, we may induce purges and severely disturb normal administrative activities.

Rosten:

Every weapon has a psychological potential. It is rather significant, however, that the first announcement of the satellite was made without taking into consideration its psychological potential. It is my feeling that this group should go on record recommending that a study of all psychological potentialities be undertaken before the satellite is used - either in announcements or otherwise. Before such psychological study, the name or the fact had better be withheld from publicity. The potentialities are so great that we must not squander them by making disclosures without fitting them into a psychological warfare program.

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Lipp:

I am glad you said this; it is very important.

Davison:

There are certain general principles governing a disclosure policy to the enemy: (1) Never exclude certain possibilities about which people might speculate - broaden the field of alternatives as much as possible. (2) All disclosures should be introduced in terms of some wider program of which a particular development is a part. The original announcement of the satellite seems to have violated this second principle.

Roeten:

The worst thing seems to be that the satellite has been announced, not with bad advice, but without any advice at all.

Lasswell:

It is to be assumed that the public discussion will continue from now on. What is to be done about it?

Roeten:

Something should be done to prevent the recurrence of the things which happened following the first use of the atom bomb - we are still debating whether we did the right thing, because the psychological implications had not been taken into sufficient consideration.

Leites:

The satellite has important implications in connection with a possible disintegration of the Politburo. This may very well require that no further information be given from now on. A second objective in using the satellite might be the "pre-education" of the Politburo by impressing upon them that this is a new world in which we are living.

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Socier:

Do we not need visibility to keep track of the satellite? And if so, is not our "political shibboleth between black and white satellites" definitely restricted by our own needs of observation?

Lipp:

A black satellite may not be sent up for experimental purposes where it is necessary to record its movements, but it may very well be sent up to accomplish certain things.

Roesten:

Even if it is decided to send the first satellite on an equatorial orbit, there will be psychological warfare problems connected with it.

Spiegel:

The discussion has shown that question 3, "continuous reconnaissance," has very important psychological implications. In this connection, some of the other questions have been touched upon. But questions 1 and 5, for instance, have not been mentioned. As to question 5, "how should we announce it," the answer seems to depend on the situation. For instance, it depends on whether the others can detect the satellite. As to whether potentialities should be "exaggerated" or "deflated," no general answer is possible.

Brodus:

If anyone exaggerated the potentialities, some U. S. scientist would deflate the exaggeration.

Stephan:

On the whole, announcements should stick to the truth. A few aspects which you can control may be exaggerated or deflated.

Coldren:

Nobody could prove us wrong, for instance, if we say at first that we've had it up for one month.

Socier:

Also, announcements may be delayed. Or we may make a truthful announcement and add that the satellite is being used in retaliation for Soviet noncooperation in connection with atomic energy control.

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Williams:

One important social science aspect has not been mentioned. Social science, after all, includes law, and the U.S. Republic is legally minded. What if Molotov should complain to the United Nations about unlicensed atom control activities?

Broder:

No such complaint could be made if the satellite were used above the Equator.

Leeswell:

The impact of the satellite upon our legal concepts is controllable. The meaning of legal concepts is how we handle words like "law." This handling of the terms may be made to suit any situation.

Goldsen:

For instance, there is a State Department publication on sovereignty and air traffic. Now it would be very difficult for anyone who is not a specialist to determine from this publication what the relevant legal concepts mean.

Collbohm:

The satellite may come outside the realm of international law, since it is the earth that rotates under it.

Leeswell:

Our position may be put very convincingly in terms of accepted legal concepts. We can use the satellite as part of a campaign for the development of international law. The emphasis should be put on the "world community" aspects of the satellite; it is an analysis of this type we need. (To Mr. Collbohm): You may be interested in a point raised by Mr. Hooten. Could you recapitulate?

Hooten:

(Summarizes remarks made earlier.)

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Collbohm:

I wondered long ago what would happen to the Soviet rulers if it were known that we have pierced the "Iron Curtain."

Spiegel:

On question 6 (timing): Is it possible to estimate how long it takes to build one? Is it possible to delay the launching, after the satellite is completed, until the appropriate moment - assuming the launching should be timed so as to give the greatest political advantage. Would the engineering feat itself be so overwhelming that we could not wait with the launching?

Lipp:

That would be so with regard to a purely experimental satellite, but not necessarily if certain specific uses are envisaged.

Leites:

Could an equatorial satellite be kept secret?

Lipp:

It is not possible to keep it secret indefinitely.

Spiegel:

If we have one above the Equator, could we threaten to send up later another one on an oblique orbit?

Leites:

This would minimize its other effects.

Lipp:

I should now like to raise one last question. A satellite may be considered as humanity's first step towards the conquest of space. There are speculations about trips around the moon and landings on other planets, and a satellite points the way to the practical realization of these fantasies. Hence, the U. S. could announce, in connection with the satellite, that it is a product of mankind rather than of one nation; that it is of universal significance; and it could invite all other nations to cooperate in the development of space navigation.

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Ridgeway:

This would immediately bring up the question of the control of extra-terrestrial territories.

Lasswell:

What are the potentialities inherent in this for the development of a world community? Could this be used to deflate older world-community conceptions, such as the Marxist concept of world unity by world revolution?

Leites:

There is no other approach of potentially equal moral effect.

Goldhamer:

Should it not be considered whether the first satellite should be made black.

Lipp:

This depends on the possibility of camouflaging preparations, particularly with regard to the necessary radio and radar stations.

Ridgeway:

If we have moral purposes in mind, it seems we should act without cynicism.

Coale:

I should like to ask two points: First: Why was Secretary Forrestal's announcement made in the form in which he made it? Second: All announcements should be viewed in a broad perspective; it is important to maintain a reputation for telling the truth.

Lipp:

As to point 1: I don't know.

Brodie:

The cooperation of other countries is essential; some may feel apprehensive about the satellite.

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Stephani: 

What are the possibilities that others will produce a satellite - especially if we disclose the technical data? What use can they make of it? What would be its value to the Soviet Union?

Leites: 

To Mr. Ridenour's point: I do not see any damaging moral conflict - preaching one thing and doing another. The main point we want to drive home is that there is no secrecy. This is a non-cynical, moral objective.

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DOMESTIC INFORMATION REPORT BY A SUBORDINATE VEHICLE

Speaker:

In view of the importance of the satellite problem, I suggest that we devote our remaining time to further discussion of this question. After this, there will only be time for me to make a few concluding remarks. We could easily devote three more days or weeks to the discussion of the various points on the agenda, but this is unfortunately impossible. The most important thing seems to be to consider the domestic aspects of the psychological impact of the satellite. I would like to ask Mr. Stephan to comment on this point, and I think Mr. Janis also has some strong feelings on this subject.

Stephan:

I have only a few very simple questions in mind. Since the announcement about the satellite has been made we can study what its psychological effect has been. We can find out how much has been retained of the announcement; how many people have been reached by the information, -- all this can be determined by querying the people. If we make no such studies now, we pass up this opportunity forever. There will be a stream of other information material from unauthorized sources; there will be speculation and rumors, and possibly also controversies among the various services. All this will introduce new effects, and we cannot isolate the effect made by the first announcement.

Studies on attitude measurement have shown that only sketchy information on public reactions to any issue is obtainable in any case. We cannot foresee what we shall get, but we can make a beginning. We can also make inferences from negative findings -- i.e., the lack of reactions.

Janis:

I heartily endorse this suggestion. What we need is research right now. Unless we seize this opportunity, it will be lost. At this point, we can observe the initial reactions to a campaign that is getting under way. Later on, the satellite will be old hat.

Davison:

There is a possible complicating circumstance: there might be other similar projects. Could an investigation on the impact of the satellite serve as an indicator concerning probable reactions to these other projects? We have to know whether similar projects exist.

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Speler:

Do you mean spaceships and the like? Or do you advocate studies concerning reactions to bacteriological weapons, for example?

Davidson:

Yes, that would be a case in point. I am also thinking of new hardware developments, such as revolutionary airplane designs.

Goldhamer:

This suggestion is important because it would add something to our investigation of the satellite -- enable us to distinguish specific attitudes from general ones. The satellite problems are in part a component of the general attitudes towards technological advance.

Goldsen:

We should consider the methodology of this kind of research. Have we a continuing series of surveys on the impact of new techniques in mind?

Stephan:

If the survey is framed so as to include a great variety of unconventional weapons, there is a possibility of getting a reaction on the "scientific age" in general, rather than the psychological effects we'd like to know. The interviewing should be done with great care to get the material we are interested in; a variety of techniques could be used.

We might envisage three questions:

- (1) How many people are informed about the satellite?
- (2) What are the distortions the information has undergone?
- (3) What is the source of information -- firsthand or hearsay?

If we get information about the degree of attention given the information, this might have a bearing upon the generation of anxiety. Some people might show worry over it as a sort of vague threat. All this, however, would be merely the beginning and not the end of our research on the subject.

Goldsen:

How about some experimental investigation (along the lines of the Princeton study about the "Invasion from Mars" broadcast). Some experimental situation might be set up.

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It might be arranged to have a network make a broadcast about the satellites, the reactions to which could be studied. Some studies about analogous subjects (the SSRC study on the reaction to the Bikini tests) would suggest that specific anxieties would be rather low.

Lippi:

Answering Mr. Davison's question whether there are any further projects, it is not possible to state at what stage these projects are. All we can say is that rockets too are being studied. But nobody to my knowledge is trying to build a vehicle of greater performance. I know of one project which has similar features: the freefloating bathysphere "balloon" by means of which it is proposed to explore the ocean depths. This project seems to be pretty well along. It is somewhat similar to the satellite since it is not intended as a destructive weapon. It might indirectly lead to some weapon development, but in itself it is not lethal.

Davison:

The answer is complete, so far as unconventional weapons are concerned. But there might be projects in the conventional sphere, such as an amphibious battleship.

Lippi:

That would not be a parallel case.

Gosala:

There seems to be an insuperable complication in studying the effect of the official announcement of the satellite. We cannot separate the effect of the official announcement from other sources of pseudo-knowledge about it. Would it be possible to find out how much people learned from the official announcement?

Brodie:

It would have been relatively easy to make a systematic survey of American reaction to the original announcement of the atom bomb. Such a survey would have been desirable.

Speier:

Was there no systematic analysis of the reaction to the atom bomb, as expressed in mass media?

Brodie:

I know of none.

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Cooley:

There was published a survey by the Woodrow Wilson Foundation, entitled "The First Hundred Days of Atomizing," but it was not very satisfactory.

Lesswell:

At the Yale Institute of International Studies, there is now a project under way. This includes an analysis of world-wide media, but only small fragments are available. There is no systematic study of the whole stream of communication about the atom bomb in this or any other country. Only small samples have been analyzed.

Janis:

Poll results on the atom bomb are on file.

Brodie:

In a study by G. Almond, there are references to the atom bomb in a "world affairs questionnaire."

Janis:

We cannot go into technical details of the survey at this point. But we could try to formulate the principal questions that would have to be answered. Two questions occur to me in this connection: (1) What exaggerated ideas appear, and what spontaneous deflation takes place? We could get an answer by asking people about their reaction, or by giving them facts and seeing how they react. (2) What are the general attitudes towards advanced technology?

Goldsen:

Presumably many people will ask when they can take the first trip in a satellite vehicle.

Brodie:

Or they could be asked, How much money would induce you to take an experimental trip?

Spicer:

Mr. Boston has suggested that any publicity about the satellite should be carefully controlled in view of the psychological potentialities. But such a survey itself would constitute publicity.

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Lasswell:

We could go on discussing the way in which these reactions can be studied. But there is another question, related to the function of policy advice. The data gathered would be useful as operational intelligence if handled by an advisory group. It is not very clear how this could be done best. But if there is such an advisory group, it should maintain a continuous survey of reactions. The group should also make an estimate of how much information is available to the Russians. This should be studied in relation to the best set-up of such an advisory operations intelligence group.

In addition, one might study the trend of information in the various media. We could study new methods of exploring problems of this kind.

A method which would have a more long-range significance would be the following: One could devise certain experiments which would be worthwhile. Small, isolated groups could be exposed to certain experiences to see their reactions to a preview of future events, using films and other means. So far, experimental methods of this kind are poorly developed, but they could be of great importance.

Our problem, then, is a double-barreled one: First, how can we best link up our operations intelligence with policy recommendations? Then, how far can we develop new methods of inquiry?

Stephant:

This problem should be approached in the same spirit as any similar research problem. I like very much the notion of "new methods of inquiry," as introduced by Mr. Lasswell.

Selznick:

As new unconventional weapons arise, it would seem desirable to isolate their "unconventional" effects. The individual feels threatened when anything occurs which indicates that the world is changing. The satellite also gives such an impression, although only to a limited extent. An experimental device might be a broadcast which would over-dramatize the effect of the satellite. This might give us an opportunity to study the critical point where the "unconventional" passes over into the "threatening."

I should like to add a warning: I have the feeling that we are very much struck by the satellite because, as a result of our training and education, we have a very strong notion of what nature should be like. But would the man in the street have the same feeling?

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Goldsmith:

If there is a strong consensus, as I assume, on the important psychological uses of the satellite, we might consider the question of what role RAND could play in studying the problem.

Spiegel:

The whole study could certainly not be undertaken within RAND. It could possibly be farmed out to an agency specializing in the opinion field. In this connection, three questions arise:

- (1) A budgetary problem; polls are rather expensive.
- (2) A security problem; if the whole field is classified, it would alter the research situation.
- (3) Our relation to the Air Force. What would Mr. Forrestal's reaction be if he learned that we are investigating people's reaction to his announcement?

An additional question is the following: Is it possible to measure attitudes without altering them?

Unless Mr. Collbohm wants to discuss these questions now, we can take them up at another time. How do you feel about it?

Collbohm:

The military services are interested in the satellite, but there has been no announcement that RAND is interested in it. Our assignment is to analyze all aspects of the problem of national security; hence we must look into the satellite problem. But RAND is not building a satellite, and it would be wiser to say nothing about RAND's connection with the satellite.

Boettner:

It is significant that no policymaker took any initiative concerning the satellite. Now that the announcement has been made, we can no longer shape the strategy of the announcement. Any survey now will be different from what it could have been if the publicity aspects had been controlled.

Goldhamer:

This may not be so important, since attitudes are likely to change anyway.

Boettner:

I was thinking about RAND's possible role in this --

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Collbom:

RAND need not conduct a survey.

Cooley:

Could one test reactions to the article on satellite
in Life?

Janis:

There are other articles in a similar vein -- about a
radio-controlled rocket that could destroy a large part of
the world.

Goldsen:

Also other publications. One could try to separate the
various strata of the public as to who heard what.

Janis:

One possible technique would be this: after learning
what the interviewee has heard, we can give him an additional
account with other details.

Goldsen:

There are many publications specializing in fantastic
stories about trips to the moon and the like. Have they ever
been interested in doing audience research among their readers?
They might consider it important to find out how out of date
their stories seem to their readers. The readers could be
polled on this, and such a poll could be handled under commer-
cial auspices.

Stechan:

I am somewhat doubtful as to the value of commercial polls
conducted by the usual type of interviewer. It is probably not
necessary to interview too many people. We could perhaps find
out by not too many interviews whether people are apt to exag-
gerate the effects of the satellite, or whether they feel dis-
turbed.

Singer:

But these results cannot be extrapolated to apply to
the Soviet Union.

Brodie:

It would make a difference whether the information people
have has political and military overtones. It is significant
that the article in Life did not dwell on this but went on to
things like trips to the moon; this reduces the significance
of the article for our purposes.

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Kennan:

We should also consider that what is being discussed starts a lot of speculation and discussion back and forth, giving away important points which should better be kept quiet. Especially in wartime, the problem is to allow too much publicity on sensational subjects.

Leavell:

After all, it seems rather doubtful whether we should try to develop new methods of exploring people's reactions. It is also doubtful how much the information would increase the range of manipulability of Soviet reactions. It seems better to employ extensively the conventional methods of opinion research.

Sneider:

What "conventional methods"?

Leavell:

Simple polls rather than refined interview methods.

Leites:

Mr. Stephan, Have you any guess as to the percentage of respondents who have any feeling that they know what the word 'satellite' means?

Stephan:

My estimate is that 55 to 90 per cent would have some notions, possibly of the Buck Rogers kind. One might perhaps ask what people think of a possible satellite with a warhead?

Goldsen:

There has been some speculation on this in the press; also on the cost of the satellite--estimated at about \$100 million, about the same as a battleship. We could ask people which they prefer.

Solomon:

We are not only interested in people's response to the satellite itself, but also in the difference it makes to people's expectations of war -- or their expectations of victory in case of war; its bearing on the level of confidence in the decision makers. Would it increase their confidence, or would they think the decision-makers are crazy?

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Davison:

A general remark: it is recognized that every hardware weapon has psychological aspects, but we have not discussed the administrative-psychological aspects of hardware weapons. One could study a possible agency which would be charged with the problem of avoiding psychological blunders, or making psychological capital out of the unconventional weapons.

Lasswell:

What happened to Mr. Rosten's proposal that Secretary Forrestal should have psychological advice in connection with press releases? If this is in RAND's province, this is an important suggestion we should make now. Is it feasible as an outcome of this discussion to take the initiative on an advisory procedure?

Rosten:

I should like to stress that I hope the outcome of this conference will be that there will be some pressure upon RAND to recommend to the Air Force to urge the setting up of machinery for handling the psychological implications of weapons. I concur in what Mr. Lasswell said.

Collbohm:

This is a good suggestion. But the overall control of psychological warfare is a very extensive problem which RAND cannot tackle in its entirety. There have been many strong recommendations about setting up an agency to advise on the psychological warfare results of various actions and statements. Such recommendations can be passed on to the Air Force, but they are only a tiny part of the overall problem.

Lasswell:

Mr. Collbohm's remark is important: if we discuss the best way of producing a psychological impact upon policy, the satellite is not too big a factor. But it is a very unusual weapon. If part of what we said was correct, it would be of great importance, and it would be good if psychological blunders could be avoided.

Leifer:

I second. An official recommendation might go to the Air Force; there are many scientists connected with RAND who could take this up with Compton who could discuss it on the top level. I would suggest that this be considered. Some people talk as if there were engineers at San Diego riveting away on the satellite. But as a matter of fact nobody has bought it, and this recommendation would be good if it only led to paying special attention to the important psychological effect of the satellite.

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I agree; it would be a good idea.

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Hall:

I would like to enter a mild note of protest. The way in which these things are revealed cannot always be controlled. Security is often violated. This whole field is dangerous ground. If you tell scientists they are not allowed to talk about certain things, things that are psychologically important, they would stop thinking about them.

Ridgway:

We said that the device itself cannot be concealed. We cannot control every aspect of the national scene to see this through. But a small group could operate in the real world of disclosure and speculation, and advise on what should be done. They could not keep people from talking; they always talk. But this program would be a positive rather than negative one.

Rothen:

There is no intention to restrain scientists. The only point is that it is always important in what way things are disclosed.

Speaker:

Would you like to make a concluding remark, Mr. Stephan?

Stephan:

How can we know about the psychological effects of a weapon? It would be brave indeed to assume that we know. We are at the early stages of knowing how to determine psychological effects.

I feel we have made genuine progress; we have come out with a specific result which could be the beginning of others.

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JANUARY 26, 1949: AFTERNOON SESSION (FORMAL)

UNCONVENTIONAL ECONOMIC WEAPONS

Speier: Mr. Hitch now is scheduled to speak on "unconventional economic weapons." I feel, however, that we should devote more time to the satellite, for two reasons. First, the subject itself is very important and ought to be considered in more detail. Second, Mr. Coale in this morning's discussion raised the question of the satellite's impact upon our own people. Thus far, we have restricted our attention to effects upon the Soviet Union, but this second question also is important. We might resume this discussion now and hear Mr. Hitch at 3 p.m. Or do you prefer to talk on the unconventional economic weapons now? In that case, the satellite discussion will be resumed later.

Hitch: I would prefer to start now.

Speier: Then the satellite discussion will be resumed at 3 p.m. Mr. Hitch has the floor.

Hitch: "Economic weapons" and "economic warfare" are vague terms; they are used in manifold senses. The adjective "economic" always refers in this context to the economy as a whole and not to activities which are "economical" in the sense of avoiding waste. However, if we speak of an "economic weapon" or "economic warfare", we may mean two very different things: on the one hand, we may mean that our weapons and activities are directed against the enemy's economy; on the other, we may mean that the weapons and instrumentalities themselves are of an economic nature. In the last war, the term "economic warfare" was used in the former sense; it covered all activities, carried on by whatever means, directed against the enemy's economic capacity rather than his forces in being. Thus, the Board of Economic Warfare had to do with such activities as: strategic bombing, pre-emptive buying of strategic raw materials and other commodities, and blockade. Now "pre-emptive buying," for instance, would be a part of "economic warfare" in both senses of the word I have distinguished; it is both directed against the enemy's economy and carried out by purely economic means. The other activities were also directed against the economy of the enemy, but the means were of a non-economic nature.

If we consider a possible future war situation, it is apparent that pre-emptive buying combined with blockade would not be highly effective against the Soviet Union which is far less vulnerable to this kind of action than Germany was.

All three strategies: strategic bombing, pre-emptive buying, and blockade, comprise what may be called "conventional economic warfare." But I want to talk about "unconventional economic weapons."

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What are the unconventional economic weapons which either the United States or the Soviet Union might employ in a future war? We could include atomic, chemical, biological warfare, and bacteriological warfare. However, they are directed against the enemy's economic system. I prefer to restrict my discussion to predominantly economic or psychological instrumentalities, rather than "hard" ones.

To begin with, I should like to make a general remark: a nation's economy in general is very "tough"; it is difficult to dislocate it by outside interference. An economy may be disrupted by the total impact of a major war, but also by internal factors such as depression and inflation. In all these cases, we have to do with extremely powerful forces. This is easily seen from the fact that even modern governments, with all the means of action at their disposal, find it extremely difficult to neutralize inflationary or depression trends once they set in. How great the effect of war upon the economy is can be seen from the fact that all "economic warfare" activities I enumerated were unable to prevent German war production from rising until 1944. Thus, it is difficult to influence a country's economy by outside interference; the instrumentalities I shall enumerate are limited in their impact. Some, however, are more effective than others.

I shall distinguish six "unconventional" economic strategies:

(1) Fomenting strikes and sabotage. One strategy - which seems to me to be more effective than the other purely economic strategies - could be employed by the Soviet Union against the United States and other countries: fomenting strikes and acts of sabotage by labor. The strikes might be of the officially declared or "wildcat" variety. The Eastern European countries are especially vulnerable to this economic weapon; the United States might be susceptible to a limited extent.

(2) Operations on financial and a few commodity markets. This has been suggested but is not worth discussing at any great length. It was suggested that the Russians might buy certain strategic commodities and withhold them to harm the economies of their opponents. However, it is enough to refer to the inertia of every economy to see that the effects would be closely circumscribed. There might be some special circumstances in which these strategies could have some effect. It is just conceivable that last year, when the Marshall plan was put into operation, the very poor grain harvest in Europe and the resulting world wheat shortage might have enabled the Russians to engage in certain manipulations which would have aggravated inflationary stresses in the U.S. and western Europe. Apart from such situations, however, the effect of such activities would be negligible.

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(3) Propaganda: ~~SECRET~~ probably best classified as a psychological weapon. All governments are practicing it. The U.S. is not the only one. Just now, however, the U.S. is the only one that can carry it out. The U.S. is the only one that can supply it. The U.S. is the only one that is involved in this. Because of the nature of the possibilities of influence here, we must be very careful in restrictions. probably have a more harmful effect upon us than we could produce upon the Soviets by similar weapons.

(4) Fiscal and monetary: it has been suggested that the Soviet Union might be able to induce fiscal policies in the U.S. or Western Europe either to foster inflation or to cause or deepen a depression. For instance, it was said that the reason why the Soviets took such a belligerent stand was because they knew that thereby they could induce the other countries to divert a large part of their resources to military preparedness, thus intensifying inflationary processes. Now that the potential danger is that of depression, it could be reasoned, the Russians have become sweet and reasonable. - hoping that if the Western powers suddenly reduce military expenditures, an acute depression will ensue. For my part, I rather doubt that such considerations play a major part in determining Soviet policies. I don't know whether the Russians operate on such Keynesian principles, or how good they are on forecasting. Such calculations may always turn out to be wrong.

(5) Propaganda in general: the enemy is confronted with an aroused public opinion, so that he dare not take the measures which would be economically desirable but is forced to pursue a self-defeating course. This is certainly of some practical importance. For example, as a result of Communist propaganda in Italy, employers are not allowed to discharge workers even when they cannot employ them profitably; or Communist propaganda in France reinforces resistance against rehabilitation of the Ruhr which is needed to strengthen the economy of western Europe. Or again: Communists and other groups in certain countries are campaigning against economic collaboration which would benefit those countries, on the grounds that the U.S. is a "reactionary" power, or that its economy is so unstable that it is unwise to team up with it.

(6) Manufacturing of counterfeit money or ration points: this would clearly be of minor importance.

Of all these instrumentalities, (1) seems to me to be the most important; it would have the most widespread psychological effects. It would be important to study possible counter-measures.

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... economic weapon might be used for the purposes of discussion in the narrower sense defined in the beginning, that is, to denote means which are themselves economic in nature, such as (2) ...

One more strategy may be considered, although it would seem to be broader political rather than economic warfare; that is, appeals to enemy populations based upon their economic self-interest. This includes Soviet propaganda appeals to the working class of capitalist countries, and we might make such appeals to certain groups in Russia, Eastern Europe, or Asia; agrarian interests could be appealed to in this context.

Davison: In our PW against the Nazis, we did appeal to peasants not to deliver their stocks, and there is some indication that such appeals were effective. Similarly, we appealed to the nationals of subject countries to refrain from performing labor service for the occupying power. It is important for the planners of PW to know in which sectors of the economy individual decisions are possible.

Hitch: Individual decisions based upon calculations of self-interest?

Davison: Yes, that's what I mean.

Coale: How would the situation in Yugoslavia fit into this discussion?

Hitch: That would be too general a problem to consider in these terms.

Boston: Could we not add a seventh point: diplomatic strategy?

Spaier: Under point (3), should we not include import as well as export licenses? E.g., the Soviet Union might force its satellites to forego certain imports. Point (3) would be import and export controls.

Lasswell: Another additional point would be the elimination of key economic personnel which would clearly be of major importance in a centralized planned economy.

Hitch: Yes, in this connection we may add two more points:

- (7) The elimination of key planning personnel.
- (8) The elimination of key planning records.

Brodie: I am somewhat disturbed that in your presentation, the ECA as an economic weapon was dismissed too lightly. I hope you do not want to imply that we have to narrow down the scope of discussion in such a way that ECA would be viewed chiefly as a diplomatic rather than economic weapon.

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Hitch: Do, ECA be not to be disregarded; in fact, it may be more important than the specific points (1) to (6).

Goldberg: Especially if we consider from the psychological point of view the embodying a threat - set of deprivations, being threatening to the satellite countries.

Spiers: How effective such a "threat" can be we have seen in the case of Czechoslovakia's initial reaction to the Marshall plan.

Lamond: Could you make some comment on points (7) and (8)? What would be the result of picking out specialized personnel? What would be the magnitude of the impact?

Hitch: There are indications that the destruction of the central records of the Soviet Union would be of altogether major importance. I wonder whether this could be achieved by an A-bomb attack upon Moscow.

Brodie: I recall that in the last war, a major disturbance was caused in Germany when the records of the Admiralty were destroyed. The men were not paid for a certain period because the payroll records were destroyed.

Coats: What is the importance of the destruction of factories and personnel?

Hitch: Strategic bombing, especially with A-bombs, would clearly have the greatest impact upon the enemy's economic potential.

Lipp: Do you include under (1) all labor activities other than strikes, such as make-work clauses, featherbedding, etc.?

Hitch: I was thinking of strikes and outright acts of sabotage, such as flooding mines, which would completely stop production. On the other hand, I mentioned all propaganda effects under (5).

Brodie: It seems to me that the real danger under modern conditions is not the strike or work stoppage as such, but rather the conditions of the strike settlement. In order to settle the conflict, agreements are entered into which eventually lead to inflationary stresses.

Delznick: In connection with point (1), especially as regards Europe, the main thing is to seal off the political effect of strikes. They are most frequently launched to bring about political rather than economic disruption. Trade union leaders in Europe are aware of this and would like to eliminate political strikes, but the unions are vulnerable to Communist pressure. The question is how can we strengthen the trade union leaderships in their stand against political strikes?

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Lasswell: Our psychological warfare would be to exploit the shortage of consumer goods in the Soviet Union and generate pressure upon the authorities to increase the mass demand and discontent.

Brodies: We have spoken of the Soviet Union and the United States, both of which are hardly vulnerable to economic manipulation. But certain other countries are more vulnerable. Thus, all European countries are faced with a similar balance of payments problem, and the Soviet Union could increase Britain's difficulties in this respect by interrupting East-West trade.

Hitch: Yes, the Soviet Union might make it very awkward for Britain if they first permitted East-West trade on a certain scale and suddenly broke it off. But we must not forget that they would hurt themselves too.

Lasswell: Our possibilities to influence the economic strength of the Soviet Union are clearly long-range, while the Soviet Union's possibilities of manipulation are rather of the short-range kind.

Hitch: If you mean opportunities for Western Europe, I agree.

Lasswell: A long-range effect upon the Soviet Union would be the stimulation of demand for consumers goods; but the effect would be on a relatively modest scale.

Hitch: Yes, there would be a long-range inflationary trend; but the Soviets can keep it within bounds by controls of all kinds, including the control of external trade.

Brodies: As regards the Soviets' strategical position vis-a-vis Britain: The British foreign trade position is based upon bi-lateral agreements, but difficulties can always arise when it comes to agreeing on prices. The Soviet Union might offer wheat at lower prices and could thereby exploit these differences.

Bostom: What about the use of economic data as a weapon? The dissemination of certain data might induce countering moves which would have a disruptive effect. The data divulged by the Soviet make it difficult for us to analyze their overall economic situation.

Hitch: The evaluation of the data creates very difficult problems in deciding upon counter-moves such as strategic bombing, preemptive buying, and the rest.

Goldhamer: Would it be possible to resort to irrational buying policies in order to confuse the enemy? For instance, what would happen if they learned that we import large quantities of Gulf Stream water...

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Holzman: Originally, point (9) was not included in the list of possible instruments. I think that the U.S. economy is superior to that of the U.S.S.R. in its ability to do things that the others cannot do because of lack of skills and know-how. Possibly, the distinction of advances in the atomic energy field illustrates the building up of Russian economy by five years. It would be possible to do in similarly attractive short-range goals and thereby delay really basic construction. The satellite project is a challenge which is similar in some respects.

Hitch: The satellite might be a 9th point in our list.

Goldman: In connection with this problem of influencing the economic choices of the others, is there any possibility of manipulating consumer demand - e.g. by counterfeit currency and ration books on a large scale? This might have a short range effect but could boomerang. Another possibility would be to induce a change in food habits and in physiological needs. An example is a drug which causes revulsion to alcohol. Such preparations can modify the demand pattern.

Lasswell: Are we going to distribute tapeworms?

Coale: Point (9), suggested by Mr. Ridenour, is a propaganda point. The question is what we have to communicate? Clearly it is not meant that we want to change our own program for the sake of such effects.

Leites: There is an additional factor involved in disclosure: if a datum is disclosed which the others cannot interpret, that would send them off on the wrong track.

Ridenour: It was seriously suggested that we drop tubes on Germany to make them guess what they would be good for.

Goldhimer: There are some delicate ethical questions involved in some aspects of the disclosure problem. For instance, it is traditionally agreed that all medical discoveries have to be communicated unreservedly. Now maybe a cure for cancer will be discovered in the U.S. What would be the impact upon Russians who would need the cure? Traditional ethics forbid that we withhold this knowledge, but I wonder whether this could be considered as an economical instrument we could manipulate?

Hitch: On the possibility of raising consumers' demand for goods: The Russian consumer may well desire more goods, but the decisions of the planning authorities do not primarily depend on popular desires. They can disregard them. Could we alter planning decisions by intensifying mass desires?

Roeten: The only condition for that is that we have access to the masses.

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Brodsky: Would influence planning decisions simply by increasing our own production. Their military production is in function of ours, if then mass consumption desires are also optimized, that would create a problem. Hitch: Could appeals to the masses influence planning decisions?

Kosten: If we had continuous access, mass demands could be changed. There are some clear instances of this. For a long time there has been latent discontent because of the shortage of bottles. This put the problem of increasing bottle production to the authorities. It was found that people were grumbling because they could not get medicine because of the bottle shortage. What would be the effect if such pressures were intensified?

Speier: The Soviet government is in a position to liquidate people if they complain.

Janis: We ought to bear in mind that needs of civilian defense create a production problem. The masses may clamor for radiation detection meters and atom-proof clothing. If we indicate to them they might save themselves by this, we could create another "bottle" problem.

Speier: We may communicate such things to the rulers, but the masses cannot generate enough pressure. Millions of people in Russia have no shoes, but this does not change production schedules.

Leites: But whatever the actual outcome is, it is clearly desirable to intensify wishes.

Goldsen: I don't know too much about rumors concerning impending distribution of goods in Soviet Russia; but the Nazis made use of building up expectations and satisfying them. The Nazis would announce that several caravans of fresh eggs would arrive on such and such a date, and then there would be a distribution. Black propaganda could generate such expectations - e.g. about the arrival of shoes - which would not be fulfilled. That would cause quite a letdown; the authorities would be hard put to explain it.

Leites: The point brought up by Mr. Janis is important, because such disclosures about civilian defense needs would show we are not out to kill them - and that the authorities do not protect the population.

Lipp: Benevolence shown by governments considered as antagonists may be very disturbing; the State Department was disturbed when Mrs. Peron donated clothes for a Red Cross collection for Americans.

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Selznick: Is there any weapons potential in agreements and cartels?

Hitch: This potential is somehow reduced or eliminated by the fact that the Soviet Union is not a party to such cartels.

Selznick: But we may economically integrate Western Europe. What would be the effect of that?

Hitch: I wanted to eliminate this question in order to have a more limited discussion.

Brodie: Our economic practices may do us more harm than the enemy could inflict.

Speier: As to the sabotage weapon, it is less available to us than to the Soviets.

Brodie: The Soviet Union may be in a position to induce strikes here; but the psychological effect of this is far less than the effect would be over there if we could induce strikes in Russia.

Speier: It is practically impossible for us to foment strikes there.

Stechan: We might sum up what we learned in the following terms: in totalitarian countries, the major problem is central management. Anything we could do would have economic consequences. On the other hand, any economic losses caused by interference would cause resentment and may create willingness to make sacrifices. These adverse reactions might offset the advantages gained.

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CONCLUDING REMARKS

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Speaker:

First: I have the feeling we should not try to formulate a specific recommendation. Instead, we shall have everything transcribed; the whole discussion has been put on records. We shall try to abridge the final report as much as possible; a draft will be ready in two or three weeks. This will be a big job; I may be too optimistic about the time. The summary of the conference will then be circulated among you, and I request your comments; any changes you propose will be considered.

Second: We shall try to determine which research recommendations lend themselves to in-RAND or out-RAND projects. On this also I am asking for your advice. I should like to feel that you will continue to advise us after this conference disbands.

Third: Then perhaps we shall try to organize smaller meetings on specific subjects among the social science group; we shall discuss technical problems of research. These teams would also feel the need of consulting, as to speak, with their opposite numbers in the physical sciences.

Fourth: I also envisage the possibility of calling a similar conference later, where the work to be done in the meantime will be evaluated and of calling in experts on some other problems, such as bacteriological or chemical warfare. We may find it desirable to expand the area of research.

I should be grateful to have your comments during the remaining time. But first let me make a few additional remarks.

Mr. Janis has prepared three reports for this conference; the third was distributed this morning. I should like to stress that it was not intended that these reports be discussed at this conference; they were prepared as background information. Mr. Janis should not feel that the contribution he made is not being appreciated. Since the reports are not yet in final form, and since we do not know in what form they will be distributed in the Air Force, please consider them at this point as confidential -- do not show or quote them. We shall keep you informed on when they will be released.

Do you agree that there will be no formal resolution, but that we proceed along the lines I indicated?

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Rosten:

The word "resolution" should be stricken from the record if necessary.

Spiegel:

The final report will embody all the statements that have been made.

Kaplan:

During the last two days, the moral components of the psychological problems were discussed only in terms of their impact on the population. This might lead to the wrong impression that we are interested only in the factual impact or the manipulatory aspects of moral problems, or that we think that the moral implications as such are self-understood. But I wish to enter on the record the importance of moral considerations in the decision-making process.

Singer:

Several speakers, particularly Mr. Lesswell, have stressed the moral implications of our problem, and they were clearly understood.

Porter:

It is important to make explicit what we meant when we used the word 'elite.' Otherwise, we should risk being misinterpreted.

Spiegel:

We may define the 'elite' as the policy-makers.

Goldstein:

I should like to underline the editing aspect of the final report. It would be useful if research recommendations that in the course of the conference were developed more fully than was possible in the discussion. If you have any addenda to this document, they may be incorporated in the record and everybody should feel free to submit such addenda.

Lesswell:

... final comment. I fully approve what's made of procedure. This affords some escape from the frustration due to the difficulty of referring to research projects by title instead of developing them in detail.

Mr. Kaplan's point was excellent. Our problem may be formulated in the following terms: What policies have the greatest psychological effect? What conditions could U.S.

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policy makers support without losing strength at home? We have only referred to this area of research, and would welcome an opportunity of working in small groups on questions of this nature.

Speaker:

Any further comments?

Before adjourning, I should like to express my gratitude to Mr. Stephan for his saying that he felt we made genuine progress. I hope all other participants agree. I am aware that many things could have been done better if I had adopted another mode of procedure, but I felt it was better to give everyone a chance to speak. I hope we shall reduce the imperfections of our work as time goes by. I want to thank all of you for your contributions, and hope you will continue to help us in the future.

Mr. Collibrahm, do you wish to make a statement?

Collibrahm:

I thank you for coming -- and for having put the problems into sharp focus.

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